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Golden or 5-banded; 3-band Italians.

Some Points.

We have been extensively producing honey for the last ten years, hence know the value of good queens. During all this time we have made a close study of queen-rearing, and now run over 500 nuclei, hence we know how to rear good QUEENS. During the last two years we have spared neither time, money, nor skill in procuring and breeding up our strains of bees. We have bought queens from almost all who have claimed to have superior stock. We have taken them, tested them, and crossed them to each other and to our already fine stock of bees, and we now have the finest strains in the United States. WE GUARANTEE ALL QUEENS to be large, prolific, and well developed, to give entire satisfaction, and to arrive at your postoffice in good shape.

We have wintered over 870 fine queens, and our prices will be: Tested, \$1.25; select tested, \$2.00; breeders, \$3.00 to \$5.00 each; untested queens, March 15, \$1.00; after June 1st, 75c. Discounts in quantities, and valuable premiums given away to customers. Your subscription paid one year to the *Progressive Bee keeper* upon receipt of your first order for one-half dozen queens. Send a postal for large circular, tells all about our queens, methods, etc.; gives valuable information to every one.

N. B.—Motto "High-grade queens, prompt service."

O. P. HYDE & SON, Hutto, Texas.

Long-Tongued Yellow Queens.

"The cage of bees is received. The tongue-reach is 19-hundredths. This is very good."

The A. I. Root Co., per E. R. Root.

The above is from best breeding queen. Her mother is also long tongued. *It runs in the family.*

These are my 5-band or Golden strain that have been bred for business for years. Queens, untested, \$1.00; 6, \$5.00; dozen \$9.00. Fine tested, \$1.50; 6, \$8.00. Select tested, \$2.00. Breeding, \$3.00 to \$5.00. I am printing a limited number of circulars with Florida views—nice ones—free. An extra one with different views for 5c stamp. Better get one at once.

J. B. CASE, Port Orange, Fla.

EARLY QUEENS FROM THE SOUTH

We are rearing queens now in full colonies by the best method known. Tested queen, \$2.00. Untested, \$1.00; 6, \$5.00; 12, \$9.00. Full colonies, \$6.00; 3 frame \$2.00; 2-frame \$1.50. Add price of queen to nucleus wanted. Write for discount on large orders, and circular. Satisfaction guaranteed.

Christian & Hall, Meldrim, Georgia.

Honey Queens.

Have you noticed the change in my P. O. address?

Did you know I am seeking to give my customers the best service possible?

Did you know that I have as good or better queens than can be bought elsewhere? Many have found this out, and continue my best customers. Golden and leather colored honey queens, bred in separate apiaries. Bees, nuclei, and full colonies for sale.

Price of queens—March and April—tested or untested, each \$1.00; 6 for \$5.00; \$10.00 per dozen. Breeders, \$2.50 to \$5.00 each.

— ADDRESS —

W. H. LAWS, BEEVILLE, TEXAS.

Take Notice.

We are headquarters for the Albino bees—the best in the world. If you are looking for the bee that will gather the most honey, and the gentlest in handling, buy the Albino. We can furnish others, but orders stand 50 to 1 in favor of the Albino. I manufacture and furnish supplies generally. Send for prices.

S. VALENTINE, Hagerstown, Md.

SEE Special Low Clubbing Offers on Page 308.



LONE STAR APIARIES

G. F. Davidson & Sons, Props.

Breeders of fine Italian Queens. Established in 1885. Write for circular.

G. F. Davidson & Sons, Fairview, Texas.

QUEENS BY RETURN MAIL.

The Choicest of Tested Italian Queens \$1 each.

Large yellow queens, healthy and prolific; workers the best of honey-gatherers. Safe arrival and satisfaction guaranteed in every case. Send for price list.

J. W. K. Shaw & Co., Loreauville, La.

Albino Queens.

If you want the most prolific queens; if you want the gentlest bees; if you want the best honey-gatherers you ever saw, try my Albinos. Untested queens, \$1.00; tested \$1.50.

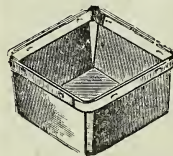
J. D. GIVENS, Lisbon, Texas.

QUEENS.—Golden Italians; unexcelled for beauty, beauty, and gentleness; bred from the best of stock obtainable. Untested, \$1.00 each; 6, \$5.00. Tested, \$1.50 each. H. C. TRUESCH, Jr., Dyer, Ark.

Fruit Packages of All Kinds.

— ALSO —

BEE-KEEPERS' SUPPLIES. . .



Order your supplies now before the busy season catches you. Price list free. Address

BERLIN FRUIT-BOX COMPANY, Berlin Heights, - - Erie County, Ohio.

D. COOLEY & CO., DEALERS IN BEE-KEEPERS' SUPPLIES, KENDALL, MICHIGAN.

Root's Goods at Root's Prices. : : Catalog free.

FOR SALE.—150 colonies of bees, with fixtures, house with contents, two lots and five acres of land in incorporate limits; fine team, buggy, cutter, etc.; also Marlin rifle and shotgun.

ELIAS FOX, Hillshoro, Wis.

WANTED.—To sell my entire and complete apiary, consisting of bees, hives, foundation, sections, shipping cases, etc (Root's goods). Every thing new and in A1 condition. A big bargain will be offered, as I must sell. Write for particulars.

E. B. FOSTER, 506 W. Warren St., Bucyrus, O.

FOR SALE.—Apiary of 90 colonies, Dove's hives, \$225; farm of 57 acres \$750; together or separate; also horses, cows, etc., basewoods at different elevations and in sheltered coves give a crop of honey every year; never knew any bee-disease around. Cause for selling, accident. For particulars address JOHN HAMMOND, Buena Vista, Scioto Co., Ohio.

BEAUTIFUL CALIFORNIA WILD FLOWER SEED. . . .

Golden Poppy, Mariposa Lily, etc., 4 packets 25c; 10, 50c; 16, 75c. This ad. will not appear again.

BOX 23, Glendale, California.

GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED
TO BEES
AND HONEY
AND HOME
INTERESTS.

ILLUSTRATED
SEMI-MONTHLY

Published by THE A. ROOT CO.
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No. 8.



IT'S TIME to suggest again that seed saved from the *first* crop of red clover will have a larger proportion of short-tubed seed. Or am I clear off? [I think you are correct.—ED.]

THOS. WM. COWAN says in *American Bee Journal*, that granulated sugar is adulterated with dry glucose. That makes me think more than ever that we ought to have some reliable source from which we could obtain pure cane sugar to feed our bees.

J. H. MARTIN and I are out again. He says, "A person devoting his entire attention to queen-rearing will strive to improve his stock." But how can he select his best stock, without having them store a crop to show which is the best stock?

A SMOKER could be made to give a *perfectly* continuous blast by having a bellows like a melodeon, and there would be no possible sucking of smoke into the bellows. But the continuous blast would be just so much the weaker, and the loss would probably be more than the gain.

DON'T BE DISCOURAGED, Bro. A. I., if you don't see many direct results from your fighting whisky, tobacco, and other evils. If it does no other good, it's making a better man of you, and for your encouragement I can tell you that, after reading last GLEANINGS, I hate tobacco worse than ever before.

"IF THERE is any class of people who seem prone to only half observe, and to jump at conclusions, it is the bee-keepers," says Arthur C. Miller, in *Progressive*. There you are again, Arthur, doing that very thing yourself. If you would observe more carefully, I think you would find that bee-keepers are better observers than the average; but bee-keeping, more than other pursuits, contains so many things that elude observation.

"GEORGE W. YORK, Chairman Central Committee, Chicago," represents one relation of a bee editor. The rottenness of the Chicago city government is notorious, and the

names of leading candidates for city officers promise a continuance of the rottenness. Now a ticket of clean men has been put in the field, with the editor of "the Old Reliable" as chief manager. There isn't a ghost of a chance of success, but it's something for a good man to have a ticket that he can cast without despising himself.

A WORKER, according to Alex. Astor (*Rev. Int.*), can carry about an eighth more than its own weight when honey is given to it. The maximum load of nectar brought in he found to be (about June 1) 65.5 milligrams (a little more than $\frac{3}{4}$ its own weight), and from then to Aug. 3 the weighings showed 50 mg., 45, 40, 28, 25, 18, 16, 10, 0. [This does not conflict with the footnote to the other Straw on this subject. It appears, then, that a bee can carry more of *honey* than it can of *nectar*—not larger in bulk, but greater in weight. These figures are very interesting.—ED.]

THAT DELIGHTFUL DREAMER in *Progressive*, Somnambulist, thinks that bee-keepers too often say "I" when they should say "we," thus giving due credit for the help of faithful wives. Amen, say I. Also that wives, like queens, should be chosen, not for beauty, but for real worth. Now, here's what puzzles me: One who places such high estimate upon the value of wives, and shows such discriminating judgment regarding them, would surely be expected to have a wife of the best type; and yet, if I am rightly informed, Somnambulist, who is no longer a spring chicken, has never had a wife.

HERE'S A HINT of value by Arthur C. Miller, in *Progressive*: "If you have no frames filled with drone comb, get some, and then paint the top-bar of those frames a brilliant red; thereby you can find them easily, no matter where they are distributed." Of course, these will be given to your choice colonies from which you will *not* raise queens. [This matter of red paint suggests the advisability of painting all tools red, which are used in the apiary. You gave this item about a year ago in one of your Straws, and it is worth repeating. A red screwdriver left in the grass would be more readily seen than one not painted.—ED.]

A NEW THOUGHT is brought out in *British Bee Journal*, that is sustained by what seems to be pretty good reasoning. It is, that, for successful wintering, the size of the cluster and the thickness of the combs (consequently the distance in spacing) must increase with the degrees of latitude. [Perhaps; but I do not believe there can be a mathematical proportion, as so much is dependent, not on the latitude, but on other conditions. The Gulf Stream, for instance, that flows around the British Isles, warms up that portion of the globe to a general average temperature above what it would be if there were no Gulf Stream.—ED.]

YOU ARE WISE, Mr. Editor, to sound a note of warning against losing our heads and depending *entirely* upon long tongues. A tall man can reach more apples on a tree than a short one; but two men of equal height may not be equally industrious at gathering apples. [Yes, and from present indications it may be necessary to continue the note of warning. While I believe in long tongues, and expect great results, yet it is evident that a good many are bound to be disappointed. The fact can not be too strongly emphasized, that daughters from the very best of mothers may prove to be very inferior; and I am afraid that 50 per cent of them may be only medium, or no better than other queens in the yard.—ED.]

THAT CART WHEEL extractor, p. 289, beats me. When "the end of the axle is planted firmly in the ground," I don't see how it is possible that "a light pressure in either direction moves the extractor and contents in direct range of the sun." If set to face the rising sun, how "under the sun" can any number of revolutions on a fixed axle make it face the setting sun? [This is a mistake of the engraver, and we did not notice the apparent mechanical impossibility until the journal was pretty well printed. The post on which the wheel stands should be perpendicular, so that the wheel will be horizontal. Then the back end of the extractor should be blocked up. As the wheel is revolved, it brings the extractor to the proper angle.—ED.]

DOOLITTLE speaks on p. 292 of a bluish-white appearance on the surface of combs, often mistaken for mold. I think I never saw it mentioned in print before, and I'd like very much to know what it is. It is seen chiefly on the cappings of sealed honey, and appears to do no harm; but after all I suspect it is something very much like mold. [I think I have seen this bluish-white coating on combs that had been stored in our honey-house, such combs not having been in contact with bees during the winter. It may be a very minute fungus or mold; but, as Doolittle says, it does no harm. But there is a mold, you know, that we sometimes see between the combs when the bees have nearly or all died. This mold is spongelike, often reaching from one comb to the other.—ED.]

OF THE HIVES that I have looked into since they came from the cellar, just two showed wet top-bars, and one of them, the worse one of the two, was a painted hive. Did the paint-

ing have any thing to do with the dampness, or did it just happen so? But Arthur C. Miller, in *Amer. Bee-keeper*, makes a point by saying that bees thoroughly varnish the inner surface of a hive; and then how can the inside moisture pass through? [Your conclusion is correct. There is no advantage in an unpainted hive, except, possibly, the saving of paint; and is it not probably true that more would be actually saved in painting the hive during a period of ten or twenty years than without paint? I know you paint only the covers. Now, seriously, don't you believe you had better begin painting all your new hives—bodies?—ED.]

SECTIONS sold by the piece will give the customer more for his money than when sold by weight, says ye editor, p. 275. I confess I don't see why, although I'd be glad if all could be bought and sold by the piece. And if the customer is the gainer by the piece plan, who is the loser, the producer or the middleman? [If any one loses in the deal by selling by the piece it is the middleman, the grocer, and not the producer. I thoroughly believe that the way to sell comb honey is not by weight but by the piece. But such selling would be impracticable unless there is grading as to weights. If one produces non-separated honey, then, of course, it would be impracticable. I have seen a great deal of fence honey that would vary scarcely half an ounce to the section in the whole crate; and in a fair year the trick is not so difficult, if I may judge from what I have seen in York State, as it would appear.—ED.]

MARCH 25 the roads were muddy and rough. I drove down town, putting in the wagon two empty supers, setting them on one side. The front one ran across the wagon and the other lengthwise. The one running lengthwise fell down. Then I put the front one lengthwise and the other crosswise. As often as they fell I set them up again, constantly changing. Out of 13 times the lengthwise super fell first every time but one. That was going down a hill, but going down the steepest hill the lengthwise super fell and the other stood its ground. If I had been hauling combs on that trip, don't you believe they should have been loaded crosswise? Now some of you report how the same thing works on *your* road. [This is an interesting and valuable experiment. It is so easily tried that I wonder none of us had thought of it before. I would suggest that those of our readers who have "to drive to town" pretty often over bumpy roads try the same experiment and report. From the results above given it is very clear that the edges of the combs should point toward the wheels and not toward the horse.—ED.]

SEVEN PAGES of last GLEANINGS are devoted to giving a black eye to solar extractors. The question is between pressure in and pressure out of steam. Gerstung thinks his pressure in hot water is ahead of either. I wish I could try one of Gerstung's. [Yes, the solar wax-extractor has its uses; but in melting up old combs it should not be employed, as it is not adapted to that kind of work, unless, for-

sooth, we could rig up a press in such a way that the sun's rays could act on the slumgum that was to be squeezed. It is strange indeed that we Americans have been all this time discovering the advantages of a steam wax press, pressure being exerted on the refuse inside of the extractor, surrounded by hot steam. I hold in my hand a copy of the *Leipziger Bienenzeitung* for July, 1893. In this are two illustrated articles describing steam wax-presses embodying the principle of a steam wax-extractor and a screw press, the screw operating inside of the extractor. These extractors are the invention of Mr. Haeckel, of Schlath, Germany. While a wax press in a vat of hot water may be all right, yet it strikes me that such a device would be much more messy than a steam-press—that is, a press that squeezes the slumgum inside of a can filled with hot steam.—ED.]

ALEX. ASTOR reports in *Revue Int.* that he made 140 weighings of bees, weighing 2300 bees in all, and he gives in milligrams the weights of different kinds of bees. From this I deduce the following table, showing the number of bees in a pound avoirdupois:

4054 bees just out of the cell.

3898 bees falling before a swarming colony (probably 2 or 3 days old).

2457 wax-workers.

3974 swarming workers.

4885 black workers in May-June.

5066 Italian workers in May-June.

5151 black workers in July-August.

5271 Italian workers in July-August.

According to that, the load of honey of a swarming bee is about $\frac{1}{4}$ its own weight. [This table is exceedingly interesting—the more so, as I think it confirms very well the figures that have been given heretofore. It appears, then, that bees weigh more during the swarming season, and that wax-workers weigh the most of any. This fact is new as well as interesting. It appears, again, that in May, June, July, and August the black workers are heavier than the Italian. I had always supposed that the average Italian bee was, if any thing, a shade larger or heavier than the black. Is it not possible that the black bees referred to were Carniolans, or of that persuasion? If so, there would be all of that difference as indicated in the table in the relative weights, for we have come to assume that the Carniolan is the largest bee of the species *Apis mellifica*; and we have also assumed that the little black bees of this country—not the brown bees—were the smallest. With regard to the amount of nectar a bee can carry, it seems to me the figures that I have seen heretofore are somewhat in excess of one-fourth its own weight. There, I have just looked it up. Yes, Prof. Koons estimates there are 4500 bees in a pound, and that 10,000 bees can carry a pound of nectar, this being the fewest number to carry such an amount. According to this, then, a bee can carry half its own weight in nectar. But Prof. Koons estimates that on an average it will not carry more than one-fourth of its own weight; and this agrees with the above figures. But so far as wing power is concerned, we know that one bee can

carry one of its companions; it could, therefore, carry its own weight in nectar, providing its honey-sac would hold that amount, which is probably not true. I have dissected the honey-sac of worker-bees when they were filled with nectar, so that they almost dropped down as they flew in at the entrance. This sac was, at the time, about the size of a No. 4 shot, or perhaps a little larger.—ED.]

THE GRAND TRUNK RAILWAY has ruled out comb honey as freight, and, according to the *American Bee Journal*, something nearly as bad is contemplated on this side of the line, namely, to make double-first-class rates on comb honey in boxes with glass fronts, whether the glass is exposed or not. That makes 6 cents a pound from California points to Chicago, and the railroads might about as well say they would not receive the goods. [I regard this as a most serious matter. I can not think of any thing that would handicap bee-keeping any more, unless it be foul or black brood, than to have the railroads practically refuse to handle comb honey. We can not afford at the present rate to send any quantity by express; and if the new freight-classification should go through, we could not afford to send it by freight. Many large apiaries would be totally unable to dispose of their product, and the industry would not only be crippled but almost annihilated. I have already laid the matter before General Manager Secor, of the National Bee-keepers' Association. Action should be taken at once, it seems to me, because it is far easier, according to our experience, to prevent a bad classification getting on the tariff-books than to have such classification rescinded after it is once in force. Why, our Association could better expend every dollar in its treasury rather than have such a foolish, unreasonable, and uncalled-for discrimination against our industry. I am sure that our worthy General Manager will take suitable action at once. In the mean time the Ontario Bee-keepers' Association in Canada should see what could be done to have that unjust ruling of the Grand Trunk Railway rescinded. It is apparent that the proposed action on *this side* of the line was instigated by the fool ruling of the Grand Trunk on the other side; and as long as it stands thus, so long it will be a menace to us.—ED.]



The nations are in wild unrest,
Armies still are fighting;
The Bull, the Bear, the Eagle too,
Are all some grievance righting.



BRITISH BEE JOURNAL.

The discussion of the proper and best size of section for use in England seems to engross the attention of the best bee-keepers there to a great extent. As thoroughly as the ques-

tion was examined here, our English friends seem to have gone further in the pros and cons. Looks, price, cost of changing, weight, have all been debated with the fervor of a legal point in court. Space forbids many extracts, but I make the following from an article written by Wm. Boxwell, of Patrickswell, Ireland:

The sections have been ordered, and are to be packed in boxes holding 250 sections and 50 fences in each box. The fence separators are to have passageways cut through the two inner upright cleats to give the bees freer communication laterally from section to section, and the openings between slats give communication from one row of sections to those on the other side of fence, while the unbroken opening underneath, extending from one end of row of sections to the other, gives the bees almost as much passageway from brood-frames to sections as is to be found between brood and extracting frames.

As Mr. Sladen has observed, this size section requires no change in the section-rack further than to tack on top all round a $\frac{3}{4}$ -inch strip, so that every bee-keeper experimentally inclined can try it and report his findings.

The price of this section, Mr. Taylor thinks, will be higher than that of the ordinary 1-lb. section. This is only for a time, while special; when, or if, established, as it is narrower and requires less wood than the beeway, it will be cheaper.

It requires $\frac{3}{4}$ inch more comb foundation than the $\frac{1}{4}$ -inch section. This is now made with so thin a base that practically there can be no fish-bone or observable mid-rib, and the extreme cost is more than compensated by the thick side walls of foundation given to the bees to draw out, and to save elaborating additional wax as in the thicker comb. The sections will be sold to dealers to distribute to bee-keepers, or to bee-keepers who take a full box of 250 sections at a time, with their fifty fence separators packed with them.

As to the weight of the new section, Mr. R. M. Lamb says, in replying to a critic:

Then he need not be afraid that the customers would not get a full 16 oz. of honey, as we could afford to give them 17 oz. or 18 oz. in a thinner section better than 16 oz. in the present. I do not think there is any danger of our adopting a light section. I, for one, would not agree to it. Such a one as I am advocating would be fair to the bees, the bee-keeper, and the customers. To fussy customers I would give reasonable information; should any say they would take my remarks with a grain of salt, I would tell them that they are at liberty to take them with all the spices together, but I would recommend them to be taken with common sense. In order to get at the exact weight of wax in proportion to honey in both old and new sections I would suggest that Mr. Love-day take a good sample of each to an analyst to deal with, and let us have the results.



HALLUCINATION OF BEES.

Sprinkling Ashes on the Snow in the Bee-yard;
Overstocking the Heath with Bees (?); Plain
Sections and Fence Separators, etc.

BY F. GREINER.

Our bees have been shut in now for over two months. The usual January thaw has not come; but we are awaiting a chance for our bees to fly now, for, generally speaking, our bees will do better when having an opportunity to empty themselves once or twice during

the winter months. There is some danger connected with an outpouring of bees when the ground is covered with snow. I have seen bee-keepers cover the snow with straw, so that any bees that drop may not come in contact with the snow, gain a safer foothold, and rise again and not chill. The majority of the bees that drop down to the ground are worthless old ones, ready to die anyhow, and one need not feel bad about the loss of them. But when the sunlight is so very bright, in combination with the whiteness of the snow, the bee seems to be dazzled. The effect upon man's eye is similar when he comes from a dark room suddenly into the sunlight. Under such a condition many strong and healthy bees fly right into the snow and die. This may be effectually prevented by sprinkling ashes and sawdust all about the hives and all through the apiary, thus changing the intense whiteness of the snow to a dark color, lessening also the reflection of the sunlight. The bees can then better take notice of the things around them, and will not fly down into the snow. It is well to pay thus a little attention to our bees at this time. Even a few bees are worth something in the spring.

In his Straws, Dec. 1, 1900, Dr. Miller says: "In the Lueneburg heath, apiaries of 120 colonies are located half a mile apart," and he thinks that not many localities here would stand such crowding. Why not? Doesn't Dr. M. overlook the fact that, when the *Centralblatt* speaks of a mile, it means a mile—not that insignificant little English mile of 320 rods, but the equivalent of $5\frac{1}{4}$ English miles? Thus it will be seen that the heath in Lueneburg is not any more productive as regards honey than the majority of localities in the United States. I believe any country that is suitable for bee-keeping may be crowded as closely as that without one apiary interfering seriously with the other. This, in turn, might lead us to the thought, "How far do bees fly in search of food?" I am aware that a great deal has been written on that subject, and still there might be a thought or two still new. Location may play an important part. In Borodino, bees have been known to travel 7 miles or more; in California, as much as 15 miles; but in most other sections of this country their flights are not nearly as extended. I am inclined to think few bees will go beyond the mile limit. I have many times moved bees during the summer season two or three miles, and I have never seen a bee come back to the old location. It would seem, had they been familiar with the surroundings of two miles around, some would surely have found their way back to their old home as they did when moved but a half-mile, as in the following instance: Once while moving bees in July a slight accident occurred on the journey. Several upper stories had not been fastened down, and slid off. The respective colonies had to be taken from the wagon right there and then, although it happened in the night. This was about half a mile from home. The bees (three colonies) had to be left there by the roadside till the next night, when they were taken on board with the next load. They

lined up pretty strongly at the home yard the next morning. Evidently they thought they knew where they belonged.

Occasionally one finds quite a difference in the character of the honey gathered in different apiaries located within two miles of each other. If bees gathered their loads in fields up to within 15 miles, or even 7, the honey gathered in apiaries so near each other would be quite uniform, not only in quality but in quantity. We do not find this so.

I have an out-yard but $1\frac{1}{2}$ miles distant. I always get buckwheat honey there; my home yard does not produce it in such quantities. Combining all these minor facts and observations I can not believe that bees ordinarily make such long flights as from 7 to 15 miles.

I have received of late a circular from a dealer and queen-breeder in Maine. His comb-foundation samples are unsurpassed. He will work up wax on shares. It is interesting what he says about the no-beeway sections and fences. "The plain section has no beeways in the box; they are provided for in the fence separator. Some have cleats *nailed* on, where the boxes come against them, these cleats being exactly the amount lacking or taken off from the box. Now, I want to ask, *Is it any advantage to the bees whether the bee-space is on the box or the separator*, after being crated and ready for use? How are the bees to know the difference? Now let us look at the separator. It is composed of slats, there are beeways through it. Is there any thing in this? Some one thinks *it is*, as the bees can *see through it and see what the neighbors are doing*. Now, brother bee-keepers, can a bee *see* in the dark?"

It would lead too far to quote any more of this, and I wish to say: Now, brother beekeepers, if you can bring out any sound arguments and facts either against or for the plain section or fence separator, let us have them; but do not waste breath with any talk of that kind. Time is worth too much to listen to it. Has it ever been claimed that the no-beeway section, *per se*, is of any material advantage to the bees? Has any one ever asserted, that, because bees can see through the beeways in the fence, they will, on this account, do better work? I answer no to these questions. Let us stop inventing ridiculous objections. I myself prefer to use a cleated whole separator; perhaps a wire-cloth separator, if I should get to using it, might suit me best—I do not know. I like the cleat on the divider because it gives us a box brimful of honey—an advantage to the consumer, not to the bees or apiarist. Shipping-crates will hold more no-beeway honey—an advantage to the apiarist. Perfectly free communication in the super insures better filling of the sections. I have used hundreds of supers without separators and free lateral communication. The sections in these were *always filled and sealed clear around to the wood*, an advantage in more ways than one. The more the free communication is hampered in the super, the less perfect the filling, other conditions being the same. While it is not denied that a good deal of perfect honey is made in supers between

whole separators, the chances are not as favorable as with wire-cloth separators or no separators at all; and the fence separator has its merit on account of the freer communication, not on account of the cleat. In these times it is entirely out of the question to produce comb honey without separators of some kind, and we might as well choose the best one in the lot while we are about it.

Naples, N. Y., Feb. 6.

[It is truly laughable, some of the objections that have been raised against the plain section and fence. The idea that it would make any difference to the bees whether the beeway was in the sections or separator or fence, is too absurd to require refutation. The fence system, while it favors indirectly the bees, favors the bee-keeper particularly. It does not make any difference to the bees whether they store honey in an old box hive or in the best hive ever invented; but it does make all the difference in the world to the bee-keeper what kind of hive he uses. The more marketable he can make his honey with the minimum of labor, the better. If modern appliances offer facilities that worthless appliances do not offer, then those are the appliances to adopt.

Bees seeing in the dark—well, I am not sure that they do *not* see. If we really thought the bees needed to see, we would make our hives with doors and windows and skylights.

But the fence, in spite of its opposers, is quietly making its way into the graces of beekeepers everywhere. So far I do not know of any one who has given the fence system a careful trial on a reasonably large scale who has abandoned it.—Ed.]

HOFFMAN FRAMES AND THE MATTER OF PROPOLIS.

The Eight-frame Dovetailed and Ten-frame Jumbo.

BY W. W. SHEPARD.

Dr. C. C. Miller:—I commenced keeping bees in 1894, and have been feeling along in a small way, keeping not more than ten colonies, and studying their ways, also reading all I could find on the same. I now wish to build up to 100 colonies; and while I have practically little invested in hives and fixings, I am anxious to start with the best hive for the production of comb honey. As you and I live in about the same latitude, and, I should judge, about the same average temperature, I believed you could give me valuable information in regard to hives, as you have been testing the merits of different ones.

I will say here that my experience has been with only the Dovetailed hive and Hoffman frame. I lived, until the past year, 30 miles north of my present location, and the Hoffman frame worked all right there; but there is a large amount of propolis here, and the Hoffman frame is not *the* frame. Our surplus is from clover, basswood, and buckwheat (all we got this year was from buckwheat).

I am only a beginner, but I can not see for the life of me how one can counsel both the eight-frame Dovetailed and the ten-frame Jumbo for the production of comb honey. It seems to me that they are so wide apart that one or the other must be wrong.

My experience with queens satisfies me if I can get one to fill eight Langstroth frames with brood. I know that, if I succeed in doing it at the right time, I get the honey if there is any to be had. I winter on summer stands, but use a winter-case. Perhaps double-walled hives would be better.

In regard to covers, I am sorry to say that I have not seen any thing yet as good as the old telescope covers. I have never had one sent yet but would get out of shape and leave a crack.

Wayland, N. Y., Jan. 3.

[Dr. Miller, to whom the foregoing was sent, replies:]

You are very wise not to wait until you have a large number of hives on hand before settling down upon the one you wish to use exclusively; and it would have been still better if you had been trying something else, even while having only five or ten hives, if you think the kind you now have are not most suitable.

The same latitude does not necessarily make two places alike for bees, nor even the same temperature. The winds make a big difference, and I suspect your winters in York State are not so severe as out on these prairies.

It may be worth while, seeing the trouble you have with propolis, for you to do with your Hoffman frames as I have done with some of mine — cut away the parts that trouble, and space with nails or staples. To avoid trouble with propolis, one must have frames that have the smallest possible points of contact. The frames that are spaced with staples come well under this head. For my own use I prefer a frame a little heavier than that furnished with the Dovetailed hive, having top-bars, end-bars, and bottom-bar all the same width, $1\frac{1}{8}$ ", spaced sidewise with nails and endwise with staples. The spacing endwise is important to avoid propolis. A very serious objection to this frame is that it is not at all standard, being made only to order, which is in and of itself an argument in the line of showing that it would not be liked by others as well as by myself. It is quite possible that you might like the regular frame with all staple spacers better. One good thing is that all three of the frames so far mentioned may be used in the same Dovetailed hive.

From your experience you are well satisfied if a queen fills eight L. frames with brood. I take it that you are using eight-frame Dovetailed hives, and my experience coincides with yours. Very few queens will have the whole eight frames filled. Some will have seven filled, and perhaps the greater number will have very little if any brood in either of the outside frames. But it would not be a very safe thing to conclude that, because only six frames are filled with brood, therefore a six-frame hive is large enough. The queen that

has only six frames filled in an eight-frame hive will not have as many as six in a five-frame hive. For some reason the bees do not seem to fill with brood the two outside frames. One reason is that pollen takes up a good deal of room, and the outside frames are the favorite places for a store of pollen.

So it will not do to argue that, because your best queens fill only eight frames, and others fill less, therefore an eight-frame hive is large enough. Take one of your colonies in an eight-frame having eight frames filled with brood. Now, how do you *know* that the same colony would not occupy more room if they had it? You may, however, say, "But the number that now fills eight frames is very small, and I don't care to have hives for the exceptional ones, but something about average." That does look plausible; but here's a better way: Have hives with room enough for the very best queen; encourage a large amount of brood by giving all the room that can possibly be used, and then by careful selection in breeding bring all colonies up to that standard. It is quite possible that, by confining your bees for a series of years to five-frame hives, you would finally have a strain of five-frame bees; and it is just as possible that, by giving abundant room, and making careful selection in breeding, you may increase the amount of room needed for your average colony.

Turning aside from theory, let us refer to actual facts. Here is what I have found:

When I have kept a colony in a hive with only eight frames, the eight frames have not always been filled; and in no case has such a colony filled more than the eight frames — never, in a single case. When I have given a colony two stories with sixteen frames, it has filled eight, ten, twelve, and in some cases fourteen and fifteen frames. It is possible that your bees would do as well; and in any case it is possible for you to have bees that will do as well.

When it comes to the direct question as to what is the best hive, I confess I don't know. After trying a good many others I had still not lost hopefulness, and expected a good deal from the Draper barn, or Jumbo, as you now call it, with its ten large frames. To me it is a stirring sight to see one of those frames filled with brood. The great thing that I expected from these hives with room equivalent to more than twelve L. frames was that there would be very little swarming. I am very sorry to say that in this I have been disappointed. The past season was not very bad for swarming, but the very first swarm came from a Jumbo, and one of the other two would have swarmed if I had not prevented. Even if I couldn't get as much surplus from them, if they were non-swarmers I would stick to them. But in respect to swarming they were a disappointment.

I expected, however, that after colonies became well established in them they would yield harvests above the average. I'm sorry to say they have been disappointing in this regard. I don't know why. Last spring the three hives contained rousing colonies; but

the yield was not above the average. If run for extracted honey the case might be somewhat different.

At present the best thing I know of is to use eight-frame Dovetailed hives. But I don't restrict myself to eight-frame colonies. When a colony has six frames filled with brood it gets a second story, if not before, and the bees have full permission to work down into this story which is added *below*, and they have all encouragement to build up as strong as possible before the harvest. It's the colonies strong at the beginning of harvest that do the business, and unlimited expansion is allowed up to that time. How much brood room then?

One year of failure in the harvest I had just one colony that gave me any surplus. That gave me one super and the others gave nothing. The one that gave the surplus had two stories (sixteen combs) for its brood-chamber throughout the whole season, and I think none of the others had more than one story. That looked as if it was the right thing to have two stories all the time. But I never could get the same experience repeated. I tried it quite thoroughly, but I couldn't get as good results with two stories as with one.

So my present practice is to reduce the brood-chamber at harvest to one story with the eight frames full of brood. It's not contraction. It's leaving the colony as much room as it had before, only it's swapping room in supers for the room it had in the brood-chamber. I don't know that it's doing violence to the instincts of the bees, for when a flow of honey comes the bees seem to get so interested in gathering that they shrink the space occupied by brood. At any rate, eight frames are all they have while the supers are on. When the supers are taken off they can have another brood-story if they want it. Before winter sets in, one of the stories is taken away. That makes it easier to handle the hives in hauling from the out-apiaries, and in getting into the cellar. If I were wintering outdoors (and I wish I could) I think the two stories would be allowed through the winter.

I think that's about as near as I can come to answering your question. If there's anything more you want to ask about, and I know enough to answer, I'll tell.

Marengo, Ill.

C. C. MILLER.

[With regard to Hoffman frames, I think that in all my travels I never saw a locality where there was so much propolis as at Dr. Miller's. I then and there agreed with the doctor that in and about the region of Marengo, at least, Hoffman frames were impracticable. The matter in our catalog regarding Hoffman and staple-spaced frames suggests there are some localities where Hoffman frames will not give satisfaction; and it recommends that in such, staple-spaced frames be used instead. But in spite of that statement, very few of the last named are sold at all, while the Hoffmans have almost the exclusive run; and even in Cuba, where I have been advising against the use of Hoffmans, that form of frame is the one we sell most of. While propolis is plentiful, yet, owing to their

very warm climate, it never becomes stiff and hard; and our Mr. Boyden, who visited Cuba, said the Hoffman frames handled very nicely. I have been surprised myself, over and over again, even where I have urged the metal spacers, that bee-keepers prefer the Hoffman.

Regarding those Jumbo hives, I think your experience was very exceptional. The experience of Dadant and all his neighbors has been that such hives do not cast swarms; at least I think the statement was made that it was the exception to have more than one or two per cent of swarms.

Where the honey-flow is dependent almost entirely on clover and basswood, perhaps the eight-frame hive is large enough in capacity; but my own personal experience is in favor of 16 Langstroth frames in two stories, sometimes reducing those two stories to one, and substituting comb-honey supers for the upper story, and sometimes putting a super on top of the two stories. The main thing is to get a large force of bees. By a "large force" I mean a colony the bees of which will weigh 8 or 9 lbs., or what would aggregate in numbers 40,000 to 50,000. If one can succeed in getting a working force and a nurse force up to this strength he is bound to get honey if there is any to be had from the fields. But such a force must not be squeezed into an eight-frame capacity without giving plenty of sections above.—ED.]

SHALLOW BROOD-CHAMBERS.

Their Economic Uses; Pollen in Sections, etc.

BY T. K. MASSIE.

Mr. Root:—In your footnote to Harry Lathrop's article, page 686, you invite correspondence from those who have been successful in the production of comb honey by using shallow brood-chambers and frames; therefore I will give you my experience, and mention *some* of the advantages of shallow frames.

For a number of years I have been using Dr. Tinker's Non-parcel hive with a closed-end frame of my own invention, containing combs $5\frac{1}{2}$ inches deep—a very shallow frame.

I have used these for comb honey almost exclusively, tiering up two and three brood-chambers to the hive, as occasion required, which gave me a deep comb for wintering, and brood-rearing purposes in the spring, and a shallow comb for the production of comb honey during the honey-flow. When a swarm issued I hived it on the old stand in a single brood-chamber under two, three, or more supers of sections, according to circumstances, strength of colony, season, etc. If the colony did not cast a swarm by the time the main honey-flow from basswoods was on I simply moved the colony to one side, set an empty brood-chamber in its place with the supers on it, as if I were going to hive a swarm in it. I then opened the old hive and shook most of the bees in front of the new one, leaving only enough bees to care for the brood, and strengthened the colony with hatching brood from the old stand in about 6 to 8 days, and

again in 12 or 15 days. Deep combs for wintering and shallow combs for the production of comb honey is one of the advantages of a shallow brood-chamber and *shallow frames*. They give us horizontal contraction in place of side contraction, and the brood-nest is always in its normal condition. The frames need no wiring, and yet the cells are never stretched out of shape, and the bees build all worker combs from narrow starters. If we want to extract from these frames the combs never break like the deep ones. The frames can be handled on the rough-and-tumble order, and not break the combs. I have tried several different kinds of hives and systems of management, but the shallow ones give me by far the best results.

Two years ago I purchased 40 Danzenbaker hives with combs about $6\frac{3}{4}$ inches deep, and have run them according to his system, and must say, with friend L., that "the Danzenbaker hive and system is all right." This season our best yield from any one colony was 128 finished sections, and the colony was in a Danzenbaker hive; but I must differ with friend L. in his conclusions that the Danzenbaker hive is an expensive one. Mr. L. says, "Among them all, no one knows better than Danzenbaker how to get comb honey; but we can't all adopt his hive, on account of the expense and work of changing." It is not fair to praise the Danz. hive and system, and in the same breath damage it by comparing the price of it with a single-walled shallow box in the rough with slats only.

Replying to a Straw, page 718, I can say that, in my locality, we have pollen coming in throughout the season. Bees gather considerable quantities of it almost daily, and with my shallow brood-chambers I have never had any trouble with pollen in the sections. Bees store pollen as close to the brood as possible; and when there is a break in the combs of more than an inch—the distance from top of brood-combs to the bottom of section combs—bees are not much inclined to pass over this space, away from the brood, to store pollen in the sections. Dr. Miller says two parties complained of pollen in the sections with the Danz. hive, and he had two of the same hives in use, and "more pollen in each D. super than 100 others." Here are four D. hives severely censured; and were it not for his concluding remarks one would think this a blow at the D. hive in particular; but he follows it with the conclusion that "shallow brood-chambers" favor pollen in the sections. Such is not my experience. I have a letter from a friend who tells me that, out of 16,000 sections produced over the D. brood-chamber this season, not one contained any pollen. Here, then, is a case, not "16 to 1," but *sixteen thousand to nothing*—16,000 sections, not one of which contained a trace of pollen. I should not fear to undertake, under a forfeit, to show 1600 sections with no pollen in them to one that has, and I would either "show up or hush up."

T. K. MASSIE.

Avondale, W. Va.

[I do not think that Mr. Lathrop intended to convey the impression that the Danzenba-

ker hive was more expensive than any other hive put out by the manufacturers, or enough more expensive to prohibit its use. He only intended to show how shallow brood-chambers *might* be used in an economical way for those who desired to experiment before they invested very much money in the general system of shallow brood-chambers.

Regarding the question of pollen in sections when shallow brood-chambers are used, this may be somewhat a matter of locality. But however that may be, I know of only three or four complaints of this character—so few, indeed, that I should hardly think them worthy of much consideration.—ED.]

BEEES FROM VERY OLD COMBS.

BY B. ROBISON.

Mr. Editor:—On page 141 you seem inclined to ridicule Bro. W. T. Stephenson's assertion that bees hatched from very old combs are very perceptibly smaller than those hatched from new comb. I agree with you that "It is very easy for one to draw wrong conclusions and wrong inferences; and *especially is this true, it seems to me, in the case before us*" (italics mine).

Perhaps where a young man has been raised in an apiary (if I may be allowed the expression) that is and has always been conducted on "scientific" principles and theories, every thing in *nature* that comes to the notice of us old backwoodsmen, and which we have known for years to be facts, if, I say, these observations run up against some theory of *scientific* bee-men, the poor soul who is timorous enough to put his observation in writing must hazard the gauntlet of scientific criticism. And now to the text.

Bro. Stephenson is right about those bees being smaller in those very old combs; and, Mr. Editor, if you had transferred as many old and almost black combs from old weather-beaten box hives as I have, you wouldn't need to take your micrometer to measure either bees or cells to know it too. It's one of nature's facts.

When I began keeping bees, perhaps it was in 1875 or '76, I found that I knew so little about bees that it was absolutely necessary for me to "read up" and take a bee-journal. Well, I happened on the advertisement of one called GLEANINGS IN BEE CULTURE, published by A. I. Root, and I subscribed for it. Well, one of my neighbors came over to see my bees and "talk bee" with me. After I had convinced him there was no such thing as a king-bee, he said his bees were running out, or his old swarm that he had brought with him in the wagon from Sedalia was, any way. I asked him what he meant by running out.

"Why," said he, "they are so small they are not more than two-thirds as big as the others from the new swarms."

I laughed at him, but he stuck to his proposition, and told me I couldn't *theorize* him out of what was a plain visible fact. Well, I put my last GLEANINGS in my pocket, saddled a horse, and went home with him to see his lit-

tle bees; and, sure enough, they were little. Upon raising up the old hive we could see nothing but old comb, nearly black, with the smallest cells I have ever seen, I think. I asked him how old they were, and it is my recollection now that he said, after counting up, and of course consulting his wife, they were about sixteen years old.

"Well," said I, "Charlie, let us see what GLEANINGS says about it. I've got a new one that I've not read, and I just now remember there was a question asked, or something mentioned about those little bees last month." Sure enough, there it was, and the reason assigned for it was that each young bee that was hatched in a cell left a very thin film, or the covering of the pupa, while in the embryo state, sticking to the sides of the cell, and in time this would cause the cells to become so small that the bees were, perforce, very much smaller because there was not room to grow larger; but if we would cut out the old comb, and allow them to make new, the bees would be the usual size. My own observation since has confirmed that position. It is a fact just the same, that those old box-hive bee-farmers know about bees, and one among the very few facts they do know about them; that is, that the bees get smaller.

Schell City, Mo., Feb. 22.

[You refer to the "young man" who was raised in an apiary "conducted on scientific principles and theories." Perhaps you are not aware that that young man will be 39 on the 23d of next June. Besides the experience that he gleaned from our own apiaries conducted on "scientific principles" he has been under the tutelage of some of the successful bee-keepers in the land, visited some of the largest apiaries, and some of the small obscure ones.

Just 21 years ago this spring I (for I suppose I am the "young man" referred to) transferred, or helped to transfer at least, something like 100 colonies in box hives into the then modern Simplicity hives. At various times after that I did more or less transferring from box hives and from old-style Langstroth hives, the combs of which had been in almost constant use for about 15 years. About 10 years ago I transferred 80 colonies. In all my experience I do not remember that black bees in any of the old box hives, or of the old Langstroth hives, from the old combs, were any smaller than the bees of the same queens that were *subsequently* reared in combs just built off from foundation. You say I would not need to take a micrometer to measure either the bees or the cells. If the difference was so great as you point out, it seems to me I should have seen it.

Again, how are we going to get around this fact, brought out by Dr. Miller on page 217 in one of his Straws? If, as he says, the cocoons are as thick on the walls as in the bottoms, the cells would measure, so far as inside diameter is concerned, 13 to the inch instead of 5, and it would, according to his calculation, take $6\frac{3}{4}$ of the bees to weigh as much as a common bee. If you have ever attempted to render up combs in a solar wax-extractor you

could hardly fail to notice the cocoons in the *bottoms* of the cells were sometimes $\frac{1}{4}$ inch thick, while on the *sides* of the cells there might be three or four layers. Now, then, if the bees will remove the excess of cocoons on the sides at all, why should they not reduce them whenever the accumulation is sufficient at any time to hinder the growth of the bees? They leave the accumulations in the bottom of the cells because it is easier to do so, and then bring the length up to the required point.

As a maker of foundation I should like to believe all you write; but I do not believe the facts really support your position. I am still open to conviction; but if you are wrong and Dr. Miller and myself right, we should be saving bee-keepers hundreds of dollars—yes, thousands.

Still again, I think you will find that the actual micrometer measurement of the waists of the bees from old and new combs will not vary any considerable amount. It is true, the box-hive men sometimes *think* that bees are growing smaller; but old bees, after the fuzz is worn off their backs, *look* smaller and blacker, especially if they are black bees, than the younger ones. If some one near here will send me a comb that he *knows* to be 15 or more years old I will put this in a colony beside a new comb. After some bees hatch from each I'll measure them with a micrometer. This will settle the question beyond a peradventure.

I have been already making some measurements of the waists of bees; and after a little I will give some of the results to the public.
—Ed.]

ARTIFICIAL OR BRUSHED SWARMS FOR COMB-HONEY PRODUCTION.

Conditions Under which Brushed Swarms will do Better than Colonies that have Not Swarmed.

BY L. STACHELHAUSEN.

On page 87 C. Davenport raises some objections to my management for comb honey. First, he thinks that in his locality it is not profitable to swarm colonies before they have started queen-cells. I do not exactly form artificial swarms for comb-honey production, but I take away all the brood and give starters in its place. The brood is hatched in another hive, but given back when it is changed to field-bees, so the whole force of the colony is utilized in this single hive. The main purpose is to force the bees into the sections.

For discussion of this objection we will ask, "What causes the swarming-fever?" Without going into details, I will say that a surplus of young bees, compared with unsealed brood, will, at the proper season, incite the swarming impulse. In small hives this is caused as soon as the number of empty cells is not sufficient for the prolificness of the queen. In large hives the swarming-impulse is not incited before the queen reaches the limit of her prolificness. I have, in large hives, many times observed that the queen had laid, during the previous 21 days, 3400

eggs daily, on an average, nevertheless no queen-cells were started. In a ten-frame L. hive the colony had queen-cells, while the same calculation showed only 2500 eggs daily. The advantages of large hives in spring can be seen at once. It would be easy to start the swarming-fever in a strong colony if we could take away all unsealed brood. The same condition can be created if we contract the brood-nest. The swarming-impulse will be incited, sometimes, later, as soon as the queen can not lay the same number of eggs any more for lack of empty cells. By brushing all the bees from the combs we have about the same proportion of young and field bees as in a natural swarm, have the same condition which incites the swarming-impulse, and, if we are careful that the bees during the operation fill themselves with honey as they do before swarming, I can not see a reason why they should not build combs as well as a natural swarm. In fact, I never had any trouble in this respect with brushed swarms, made either on the old stand or on a new one.

Second, Mr. Davenport says, "With a large yard, or on a range well stocked, a good many strong colonies will not swarm naturally, and such colonies will store more surplus than they would if artificially swarmed."

An artificial or natural swarm will store less honey than a colony unswarmed if the honey-flow is of long duration, because the swarm is getting weaker every day, till 22 days or more afterward, when the first young bees will gnaw out of the cells. This long interval is avoided by my management.

If the colonies in a well-stocked range do not swarm as much, the reason is they do not gather as much honey in the spring (overstocking). This may either cause the development of the colonies to be slower or the brood-nest less crowded by the honey. In both cases swarming is delayed.

Third, with brushed swarms, made before queen-cells were started, "the queen sulked, or, for some reason, refused to lay until considerable comb below was built, and filled with white honey."

It is important to know which way the artificial swarms are made. If very few young nurse-bees are present, the queen is not nourished properly for egg-laying. If a queen-excluder is used over an empty brood-chamber, and too much super room given, the bees may prepare a brood-nest in the sections, and have not sense enough to understand why the queen will not come up and do her duty. By the way, this is one of the reasons why pollen is stored in the sections sometimes. Pollen is always stored around the brood-nest, or where the bees expect to have their brood-nest.

Fourth, "In numerous cases I had the bees themselves sulk, and refuse to do much work for a number of days when all the brood was taken away."

If we suddenly take away all the brood, the bees will always become very uneasy, and behave somewhat like queenless bees. For this reason I give them at first one frame of brood, in some years here, when the bees are not very much inclined to swarm, and in some lo-

calities, perhaps, this brood-comb can remain permanently in the hive. At other times the brushed bees get so much the swarming-fever, contrary to Mr. D.'s opinion, that they will swarm out if this comb of brood is not taken away the first day after brushing off the bees. In this way I always get the bees to work with the same vigor as a natural swarm.

ADVANTAGES OF LARGE HIVES.

I will state again what reason I have for my management. In the spring I use very large hives to get strong colonies without swarming, and without the work recommended by Doolittle, and necessary with small hives. If, over these large brood-chambers, section-supers were given, the outcome was never satisfactory to me. If the brood-chamber was contracted before the supers were given, the result in the honey crop was not much better, and many colonies swarmed. I always had trouble with old-established colonies in forcing them to start the work in the sections. Bait combs or not, they would sometimes rather hang outside of the hive than go into the supers. I got the most comb honey from swarms hived just before the commencement of the honey-flow. From all I have read I got the impression that the bulk of the comb honey is gathered by swarms. I will mention only Niver, page 608, 1899.

At first I united three or four swarms, which I got in large numbers from ten-frame Langstroth hives, and had good crops; but during a long honey-flow these swarms became weak too soon. Using larger hives I got no more swarms. I kept all the bees of one colony together, and added to it afterward all the bees which had hatched from the brood, which I had taken away as soon as they were able to do field work and were too old to cause the swarming-fever. In 1886 I managed an out-apiary on this plan; had a satisfactory honey crop, and no trouble from natural swarms.

SHALLOW BROOD-CHAMBERS.

Shallow brood-chambers are not absolutely necessary for this management. Mine have about half the capacity of a Dadant hive, and I have used them since 1881—at first as extracting-supers, soon afterward two of them as brood-chamber, because I deem it a nuisance to have two different frames in the apiary. If a colony is prepared for comb-honey production I give at first only one story with starters, and this forces the bees into sections. As soon as this story is nearly built out, mostly with worker combs, I set the second story with full sheets of foundation or drawn-out combs under the first one, and then I have a full-sized brood-chamber again. The bees expand the brood-nest down into this lower story as fast as they need more room for this purpose, and comparatively no honey is stored there. In the upper brood-story the bees can not store honey before the brood is hatched, so by and by enough honey is stored in the brood-chamber for the later season. I do not think it will pay here to force all the honey into the sections, and feed the colony afterward.

I use queen-excluders, if they are necessary;

but if I can dispense with them I surely do so. My experience is, that by their use more honey is stored in the brood-chamber, the brood is crowded too much, and the colony is too weak when the honey-flow ceases.

Converse, Texas.

SEPARATORS v. NO SEPARATORS.

Advantages of Free Communication ; Facing Comb Honey.

BY M. A. GILL.

While the majority of honey-producers use separators, the fact remains that a great many do not. Many of the former class think that it is at least impracticable, if not impossible, to produce a nice gilt-edge article without the use of separators, while many of the latter class believe that the bees enter the supers more readily without their use, and, furthermore, that the bees can cluster clear across the super, which enables them to economize better their heat ; consequently the construction of comb is carried on faster without the use of separators than with. I myself believe this to be true during a moderate honey-flow and cool weather ; but with strong colonies and a good honey-flow I confess I can see no difference. However, I have no trouble in raising a nice article by either method.

But I think everybody should admit (whether he will or not) that honey raised with separators is faced up a little truer and neater than without them. But other things have led me to use a system between the two.

The Colorado Bee-keepers' Association has adopted 22 lbs. as the net weight of a 24-lb. case of honey. Now, while this is, perhaps, about right, I have thought that there should be a difference between the weight of the separator and the non-separator honey—say 21 lbs. for the one and 23 lbs. for the other. There are many colonies that will not store quite 22 lbs. net where separators are used.

Now, before I give my plan I wish to advise every beginner to use separators (and many who do not) as the looks of their honey crop would be greatly improved ; and to the man who puts up a nice honest article, always in marketable shape, I have nothing to say. Let him raise it as he will.

The non-separator man is ahead on weight ; but look at 100 cases of each kind piled up side by side, and the separator man's honey looks the nicer. Why? Because it is the most even in finish.

Now I don't wish to start any thing, but I wish to say emphatically that the non-separator honey has the weight, has the value, is just as good, but does not look as well. As I said before, it does not have that *even* finish.

In order to obtain the required weight, and still have plenty of honey for facing, I have been using two separators in an eight-frame super. This divides the super into three equal apartments, and allows the bees to cluster in quite large clusters. A hive equipped in this way with full-sized starters, a strong colony of bees (have them strong if it takes all the bees

you have got), and one thousand acres of alfalfa within 1½ miles, will raise fine honey by almost any method if you will set your hive laterally by a spirit-level.

Before I go any further I must go back and attend to that facing business or some one might draw upon his imagination, and take me to task for facing honey. First, I will say I believe in and practice facing honey. I do it, not only for my own benefit, but for the benefit of the retailer. Every case of honey is the retailer's "show-case." The customer sees the honey, is attracted by its looks, and places his order. He, perhaps, never again sees it until it is cut from the section and on his table. I will warrant that he will get anywhere, from a case of my honey, the same grade and value that he would from one of the face sections. But it might not look so much like the rest of the face.

In conclusion I will say to the separator men in Colorado, try a few supers, with only two separators, and see if you don't still have nice honey and a little better weight. And let the non-separator men try a few and see if they don't still have good weight and a little nicer honey.

Longmont, Colo., Dec. 20.

[In the East, nearly every producer seems to be in favor now of using separators ; but I was surprised to see there were some in Colorado who still thought they could dispense with them profitably, and yet be able to put out good marketable honey. But one significant fact was that some of those who once advocated the non-use of separators, or only one or two in a super, had gone completely back on such advocacy, and now recommended separators between all the rows of sections.

According to our own experience, we have sometimes wished there were a law by which every producer would be *compelled* to use separators. Some of the very ones who claim that their non-separator honey was as fine as any that could be produced—perfectly cratable, etc., have shipped some of their product to us, and such times as we have had with it ! One face would be bulging out against the other, and a great deal of the honey would be leaking. If the veterans make bad work of it, what shall we say of the beginner? If one thinks free communication is a good thing, let him use the fence. Thus he has a very nice compromise.—ED.]

AIKIN'S PLAN OF PRODUCING COMB HONEY.

A Scheme to Control Swarming ; Intelligent Expansion Followed by Contraction ; the Use of Double Brood-chambers.

BY R. C. AIKIN.

Here is a matter for you to try in your apiaries. It is the system to be used with shallow divisible-brood-chamber hives. You have eight-frame hives. Take two of these for a brood-chamber through the spring. Manage so as to have the brood as much as you can in one of the chambers, say by having the brood-

nest in the upper one, and spread it and manipulate to get these combs solid full of brood. The success does not depend on this getting the one set of combs solid full of brood, though to obtain *best* results it will pay to do this. With this double brood-chamber there is so much room you keep down the swarming fever, and I think the room to spread, especially downward, gives a greater vigor of work than a crowded hive.

Ten days before the flow begins, put your queen in the lower chamber with a little brood—one comb with any amount of brood will be plenty; an excluder on this, and the rest of the brood on top. At the end of ten days, when the flow is just starting, take to a new stand the lower hive with the queen, and put the top chamber on the old stand with nothing but its *sealed* brood and no queen, but give a virgin queen or ripe protected cell, or wait two or three days and give a queen or cell. Give only a cell or a virgin queen, because the brood is *all sealed* that is left on the old stand; and while the virgin is mating, and getting ready to lay, the brood is hatching; so when she does begin laying, the last of the brood is about ready to emerge, and your colony is just in the condition of a colony that has swarmed naturally, and their young queen just ready to lay, except that you have kept the strength of the colony on the old stand, and have been getting section work. As the brood hatched, the brood-combs were filled with honey; but as that young queen begins to lay, that honey goes up to the sections out of her way, and you have no swarming either.

This system anticipates quite a contracted brood-chamber left on the old stand, which would be the result with one section of a divisible-chamber hive, hence there would not be any great amount of honey stored in it during the time the queen was not laying. To make the best test with the eight-frame hives I suggest that you use but six to the body, using a dummy at each side; thus you have a twelve-frame hive before the separation at the start of the flow, and six left when divided.

The whole plan contemplates a big hive up till the flow, then a very small one on the old stand, and yet all swarming effectually controlled, the force of fielders right where they will do the most good. The old queen never stops laying, and goes right on and builds up a good colony in her new location.

This is no idle dream, and I ask that you have it tried in your apiaries this season, to be written up later after trial. I have for years been studying the plan, and, to some extent, experimenting. I think I am the pioneer in it, though another man, and a good apiarist, in this State, has also used the principle, coming at it independently of me. If I have the success I anticipate for it, it will be the system with divisible-brood-chamber hives.

Loveland, Col., Mar. 13.

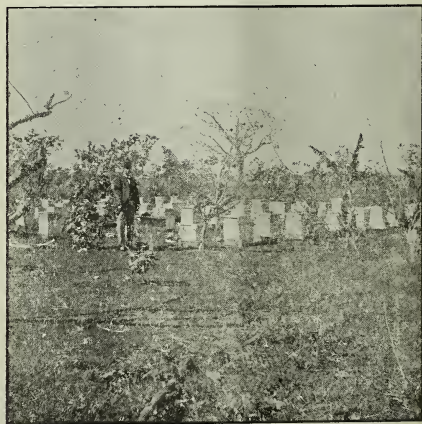
[Our readers will remember that about two years ago I advocated a plan very similar to this—that is, I practiced running two eight-

frame brood-chambers for the purpose of getting powerful colonies for the production of comb honey; then when then the honey-flow was fairly upon us I crowded this colony all into one brood-chamber and one or two supers containing sections and foundation. Sometimes I gave such colonies a shallow extracting-super, and after the bees had got them well started I took them off and substituted the comb-honey supers. There were a few of our readers who condemned the plan as impracticable and unorthodox; but I know that for some localities, and for some seasons at least, it is all right. Mr. Aikin's plan is, perhaps, an improvement on mine, and I wish a good many of our readers might try it and report at the end of the season.—ED.]

GLIMPSES OF CUBA AND CUBAN BEE-KEEPING.

BY A. L. BOYDEN.

On the Monday following, I left Havana with Mr. F. O. Somerford, who had just returned from a brief visit to the States, to visit the apiary of Mr. E. M. Penfield, which is located at San Nicholas, and managed by C. E. Riggs. Mr. Riggs formerly devoted some time to bee culture in Missouri, and is very enthusiastic in regard to plain sections and fences for the production of fancy comb honey. While they have been at work a compar-



APIARY OF DR. TORIBIO DEL VILAR.

atively short time, they have a very nice apiary, and have already secured a considerable quantity of comb honey, which has later been sent to the United States markets, so I am told.

The following morning I bade adieu to Mr. Riggs at the station, and soon landed at Guines, where, in company with Mr. F. O. Somerford, who met me at this place, we called on Dr. Toribio del Villar, a physician who is also interested in bee culture. Very soon we were driving out to his apiary, situated near the stone road leading to Havana. This is, as will be seen from the picture below, com-

posed mainly of Heddon hives. Dr. Villar is also interested in the production of comb honey, and gave me some samples of honey he had just produced. After our visit at his place we proceeded out to Catalina, where I had a most enjoyable visit with Mr. Somerford. Our trip from Guines to Catalina took us past some of the most magnificent sugarcane I had ever seen. Mr. Somerford is considerably interested in the production of sugar, and believes there is much more encouragement for investment in this than in bee culture. The very low prices prevailing for honey, and the difficulties encountered by beekeepers, are not calculated to encourage investments in this line. Mr. Somerford is a genial companion, and I regretted that, to keep a previous engagement, I was obliged to leave him early in the afternoon. He is well and favorably known throughout Havana Province by all classes. Our friend Riggs, who lives a good many miles away, told me, if I did not find Mr. Somerford easily, to ask any one I met for Senor Frederico, and he would be able to tell me where Mr. S. lived, as he is so well known because of the service he rendered during the late war. Mr. Somerford's apiary is under a shed, as will be seen by the engraving below.

The following day, in company with Harry Howe, I made a visit out to Candelaria, and to the apiary of Glen Moe. Mr. Moe's success has been quite phenomenal. Starting with almost no experience in this line less than a year ago, he now has nearly 200 colonies, and has secured upward of 20,000 lbs. of honey already. Such a result in the United States would be the means of inducing many to embark in this business. Conditions are,



APIARY OF F. O. SOMERFORD.

of course, very different in Cuba, for this honey has to be sold at 35 or 40 cts. per gallon in Havana, which leaves a very small profit to the producer.

The following Friday I spent in sight-seeing in Havana. In company with Harry Howe I visited Forts El Morro and Cabanas, the old

cathedral, and many other interesting places, not least of which were O'Reilly and Obispo Streets. These streets, as will be seen from the picture below, are very narrow, while they are perhaps the most popular and fashionable shopping streets in the city.



A STREET IN HAVANA.

During my visit in Cuba there had been little or no rain so far; but on the morning I was to take my departure for the States there came a terrific rain. I have not been able to learn from my Cuban friends whether such a rain is usual there or not, but this is how I found O'Reilly Street at ten o'clock, Jan. 4.

You will notice the vehicles are wading through water up to their hubs. Our readers will bear in mind that this is a paved street. To the credit of Havana I ought to say that I presume this thing does not occur very often. The water simply rushed down so fast over the paved street from three directions that it was very deep before it could get out the other way. The sewerage is so badly planned that it is not able to take care of such a downfall.

GRANULATED HONEY IN SECTIONS OF PREVIOUS YEAR.

Doolittle's Statement Questioned.

BY MRS. A. J. BARBER.

When I see a statement like the one on page 137 I feel like saying something contrary, even if it is a Doolittle who makes the statement. I had to look twice to assure myself that it was Doolittle's name at the top of the article. Well, they must have a different kind of honey, or else the bees are more particular in New York than they are in Colorado. When we put on left-over sections here we always have trouble about granulating. You can take a section off the hive after they have finished it, and hold it to the light, and, instead of looking clear, it will be opaque or milky; and if you cut into it you will find the middle of it a soft grainy mess that will harden very

soon after it is taken from the hive. Why, we often have our extracting-frames break out in the extractor from having granulated spots in them. Sometimes we have some left over that we have stored for spring feed, and put them on early to get them cleaned out; and if the honey-flow comes on strong and fast the bees will just clean out a little bit of it, even if we uncup it, and store a little new honey on top of the old, and seal it up. I have lost many combs this way when I had careless help in the honey-house.

I don't even use sections of comb that have been licked clean, as I had an experience that made me think it didn't pay. Several years ago I took off fifty supers of fine sections; and as I was putting them into the honey-house at my lower apiary I let one fall on my foot; and as soon as I could get the honey all in I shut up the place and came home. I was not able to use my foot for several days, and when I did get back down there I found that the bees had got in and cleaned out those 1200 sections, leaving me a fine lot of combs. I took care of them, and in the spring I put them on, expecting to get them ready for market early. There came a good early honey-flow, and those sections of comb were filled in a few days. I lifted them and put new sections under. In a little while the new ones were filled and partly sealed, but not a cell sealed on the old sections. Some of those sections had to be lifted back and forth all summer, as the bees never sealed them as well as the newer ones; and when they did get them done they were what the boys called "a measly-looking mess," as they were spotted and old-looking; so I made a lot of second-grade honey, and did a lot of lifting of supers that could have been avoided, all to save a few sections. Now we never put a left-over section back on a hive. Near the close of the season we practice the go-back system, sending the go-backs to the best colonies. What unfinished sections we do have we sort out carefully. The sections that are not good enough to put into cases are cut out and sold as chunk honey to the neighbors at six cents a pound, and we use a lot of it on our table. The thin lean sections are cut out into a tank of warm water, and the honey strained out to make into vinegar, and the wax goes into the wax-extractor, and the section boxes into the kindling-wood box. In this way I think we more than get pay for new sections, and then we have no bother with the old things. I don't want any bait sections, but am sure that here, at least, we can get a first-class article of comb honey only by having every thing clean, new, and fresh about the sections.

Mancos, Colo.

[This is more in line with the reports that we have received in the past; but here are two reports on the "other side:"]

DOOLITTLE'S POSITION SUSTAINED.

I wish to enter my protest against your way of deciding against Mr. Doolittle's judgment in using last-year's sections with some honey in, over again, for the next season's crop, p.

138. Now, I do the same thing, and like them, provisionally; i. e., I want them to be clean and nice-looking sections, with light *comb*, no matter what the quality of the honey; then uncup them if any part are sealed, and put them on the strong colonies *early*, in apple-bloom if colonies are strong enough. There is nearly always a shortage just after apple-bloom, and the bees will carry down or use all the old honey, if uncapped, and generally all they have gathered in fruit-bloom too, unless there is a very abundant flow from cherry besides. The cherry honey is light, and so is peach honey, and worth saving in the surplus. The apple honey they are welcome to, though it sometimes comes in sufficient quantity to fill their brood-combs, and sets them up in supplies with quite a boost. But when the bees get a good big start in the partly filled sections, the second time, and when the first good flow fairly sets in, and the weather is warm, I raise up that set and put another set under it, with foundation in. That is where I get my nice honey, if anywhere, for that season. But you will say many of these sections are soiled, or some may have dark honey and old comb in them. Save all such for the fall flow, when dark honey is coming in, and they will do for the cheaper grade of honey. Use only the nice ones for the flow of light honey.

This is the way I got a colony to put up over 100 lbs. of sections before they swarmed, and not a very good season either.

Now as to using old brood-combs, I have many in use that were built from 1874 to '76, and they are good yet, and give me just as good bees as any other, though "black as a boot" and tough enough to lie on their side full of honey without bending or bulging.

J. O. SHEARMAN.

New Richmond, Mich., Feb. 25.

[But, look here; I have not "decided" against Doolittle's judgment. I stated the prevailing opinion regarding the practice, and then asked for reports.—ED.]

UNFINISHED SECTIONS; IS THE HONEY IN THEM MORE APT TO CANDY?

Mr. Root:—On page 138 you invite reports regarding the use of unfinished sections, other than baits. If I understand Mr. Doolittle he does not use them for any other purpose, but advocates using the partly filled ones again after extracting, without having the bees clean them up. This has been my practice for several years, and I find it works well. I am not troubled with candied honey; but then, honey in this locality seldom candies.

I would not advise any one to use partly filled sections except two or three in each super, for baits only—especially if there were capped cells. My experience is, when the bees are crowded for room they will invariably extend the open cells beyond those capped the previous season, which makes ugly and unsalable sections.

M. D. ANDES.

Bristol, Tenn., Feb. 23.

[Let's have more reports. In the multitude of counselors there is safety.—ED.]

BEEES IN A FRUIT-ORCHARD.

How to Improve the Flavor of an Off Grade of Extracted Honey.

BY R. G. HAWN.

The bee-yard shown in the picture is located in the apple-orchard. There is a good wind-break on the north. The part of a building shown is my bee-house, 16x20. It is well built; is mouse and bee proof. It has a large cook-stove and all necessary fixings.

I have tried many sizes of hives, but on the whole I prefer the eight-frame Langstroth. I aim to run from 40 to 50 colonies, and get a surplus of from 40 to 60 lbs. per colony, according to season. I am now running almost entirely for extracted honey, for the following reasons: 1. I can control swarming best that way. 2. It is not so much expense. 3. I get more pounds of honey of first quality. 4. It sells more readily, and at better prices; and, altogether, is more satisfactory to my customers.

Our sources of honey are early spring willow, then fruit-bloom, then dandelion, then white clover, and then a second crop of red clover, with a few wild flowers.

Mine is a home market, supplied by a peddling-wagon. It took hard work to get a start; but honest dealing and perseverance triumphed. I use quart Mason fruit-jars, sev-

en and fourteen pound lard-pails, and some fifty-pound tin cans.

This county is or rather has been flooded with adulterated honey. The discussion of the subject in the papers scared the people, and generally they quit buying extracted honey. I soon succeeded in convincing them that my honey was pure, and then they bought freely. Really the adulteration worked to my advantage.

The first extracted honey from fruit and dandelion is somewhat strong and bitter, and in that condition is unsalable. I let it candy hard, which it does in a short time. Then I melt it, and again let it candy. This last takes from four to six weeks; then I melt it again, set it away in fifty-pound open cans, cover with some loose stuff, so as to keep out the flies, and I soon have a first-class article, very thick, and of excellent flavor.

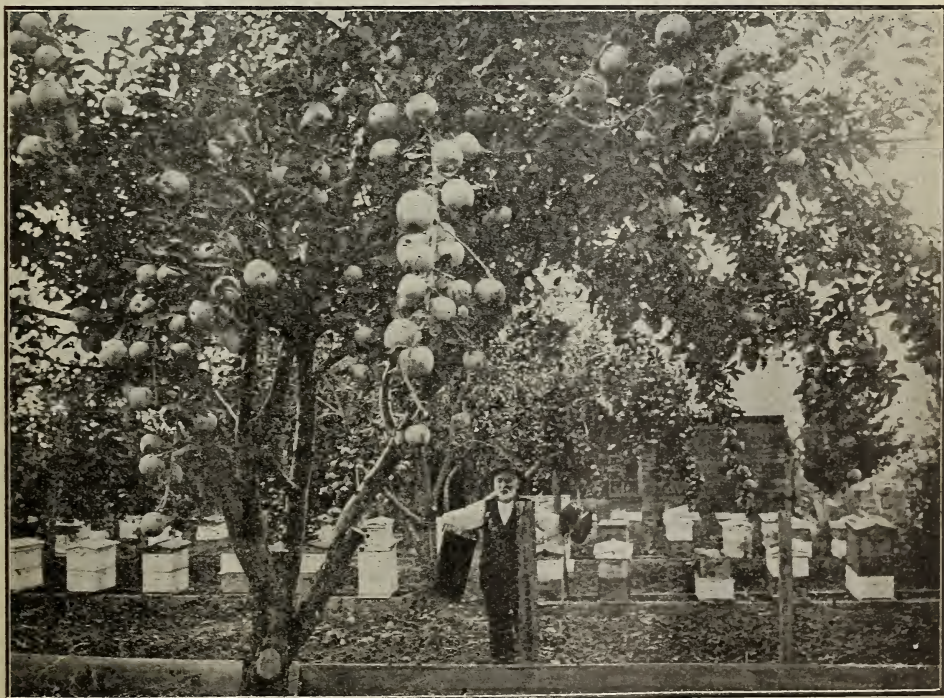
Thorpe, Wash., Feb. 28.

BEE-KEEPING FOR WOMEN.

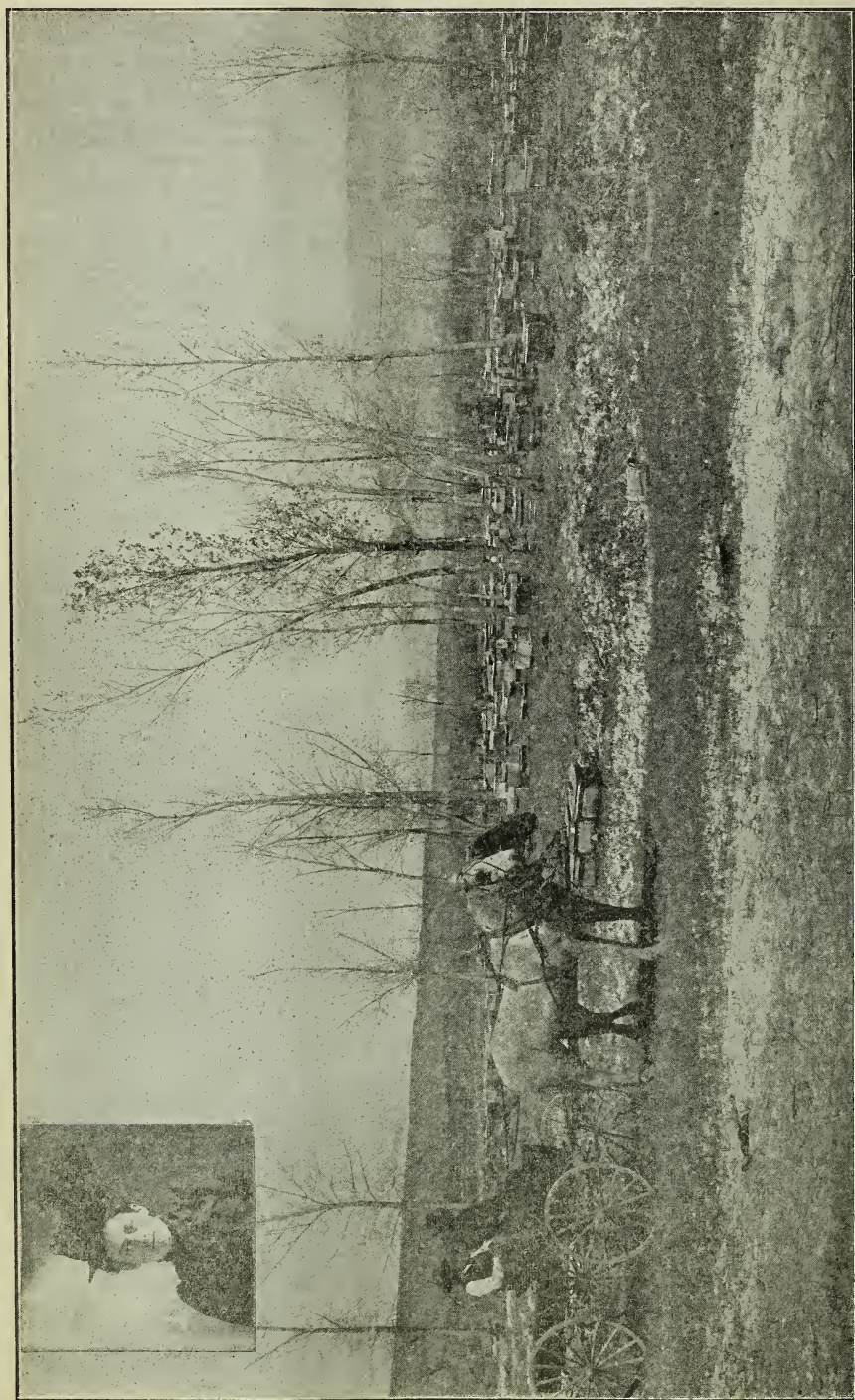
How 500 Colonies in the Rockies are Operated by Women Only, and Women who can Vote; a Big Record in Honey Production.

BY LYDIA CRAWFORD HARRIS.

I send you a picture of one of my apiaries, containing 167 colonies, located two miles south of Delta, Colorado, about two rods from the banks of the Uncompahgre River, in one



APIARY OF R. G. HAWN, THORPE, WASH. AN OBJECT-LESSON IN BEES AND FRUIT.



APIARY OF MRS. LYDIA HARRIS, DELTA, COLORADO. MRS. HARRIS IN UPPER LEFT-HAND CORNER.

of the largest alfalfa districts on the western slope of the Rocky Mountains. These colonies are in ten-frame (Langstroth size) hives, frames all wired and on full sheets of foundation. I prefer the ten-frame-size hive for this location on account of the long and mild winters. Frost generally comes about the middle of September, which destroys our last flow of honey. Then we have nothing until March. During all this time there are few days when the bees do not fly some time during the day. About the middle of March the squaw-bush blooms, which grows thick along the banks of the said river, and after that comes the fruit bloom—first the apricot, then the plum, then peach, pear, and apple; so by the first of June, when the first crop of alfalfa begins to bloom, the bees are generally in pretty good condition to store honey. This yard produced last year 160 60-pound cans of extracted honey, and 171 crates of comb honey. I have also two other apiaries, containing 334 colonies—in all, 500 colonies.

As we women in Colorado enjoy all the rights of voting, from the lowest county officers to the President of the United States, I propose to operate these yards with women help.

The farmers do not cut their alfalfa as soon here as in some other places, as they nearly all sell by measurement in the stack for feeding cattle; hence it grows stronger and larger, and, while doing so, naturally blooms longer.

We also have drawbacks in this part of Colorado, which I find mostly in freight rates; but these are not so high as I understand Mr. J. W. Hammersmark says they are, page 46, from the East to Reno, Nevada, or vice versa. At the same time, according to Mr. Martin's figures on page 81 it costs \$270 more to ship a car of 30,000 pounds from here to the East than it does from Los Angeles to the East. The freight rate is the same from here on comb honey as on extracted honey; and considering California and Cuba's prospective large crop of extracted honey I shall operate my bees principally for comb honey.

Delta, Colorado.

[We admire your spunk and independence. If the right of franchise has this effect on the gentler sex, let's give the women a chance. If the women of the land could vote there would be less of jobbery and wickedness in high places. I'll risk the women every time. —ED.]

ROOF APIARIES.

My Experience in Roof Bee Culture; Rearing Queens on a Tin Roof, and their Safe Introduction.

BY C H W. WEBER.

It is my intention to give my experience in the bee keeping line as few practice it (that is, on a roof), and also a few suggestions which may prove valuable to other bee-keepers who may be in the same kind of boat as I. I have kept bees on a roof in a small way for several years, but not until recently did I find it nec-

essary to increase my stock and move the same to the roof proper, where I had much more room, and more benefit from our sometimes too warm friend old Sol.

This mode of bee culture has its peculiarities, many of which I have already discovered, and some not altogether to my liking. I soon discovered, after the weather began to get hot, and combs began to get shaky and tumble down, that some method would have to be resorted to that would shield the hives from the direct rays of the sun, and also from the reflected heat. After some consideration, nothing seemed to possess so many good points as the long-shed arrangement shown in the photograph. This was all right to keep the sun off; but as the heat was also reflected up from the tin roof I found it necessary to pack all around and under the brood chambers with six inches of chaff, and since that day not a comb has melted down, nor am I troubled in the least from excessive heat.

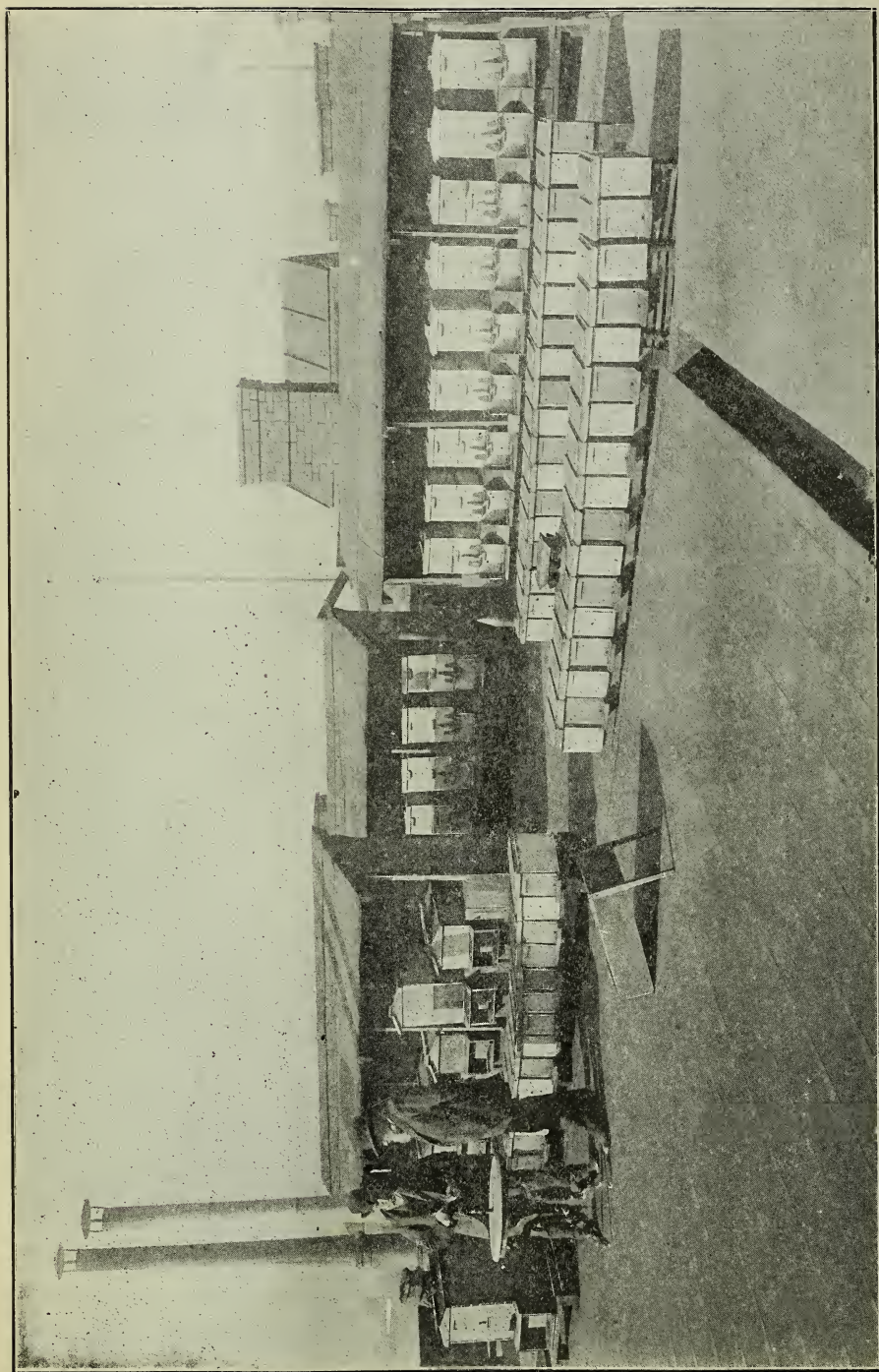
Winter also has its drawbacks, and the cold is just as hard to contend with as the heat; but after having flaps, made of heavy canvas, put on the rear, and the brood-chambers still surrounded with chaff as in summer, little or no wind can strike the hives directly; and on the coldest day, if I work my hand down between the hives into the chaff, I always find it nice and warm, and the bees always ready to let me know by their contented hum that they are still very much alive. So much for the protection and shelter. Now let's look at the queen-rearing side of the subject.

TO RAISE GOOD QUEENS.

I have found out as others have before, that the only way to get them is to use extra-strong colonies for this purpose, and I rear all queens in the second story of a double-brood-chambered hive, something on the order of Doolittle in his book. In the second story I place four frames of well-matured brood nearly ready to hatch. Between each two I insert a comb containing some very young larvae, and eggs; then under the whole I place a queen-excluder, and take good care that the queen is on one of the combs below. This puts the bees in the same state as supersedure, and in three or four days one can find queen-cups on the center comb, which the bees have built for the queen to lay in.

After they are well started I insert on a frame artificial queen-cups previously supplied with a young larva from my choice breeding-queen, and destroy all cells which the bees may have started on the combs. On or about the tenth day I supply myself with a queen-nursery for each cell, and then proceed to single out the cells which I want to save, by surrounding them with one of these little cages which the cells and cell-frames are arranged to take without any trouble. In two or three days I have as nice a lot of virgin queens as any one would wish to look at. They are then introduced into the nuclei, and in another week or ten days they are ready for Uncle Sam's care or to be introduced into their future homes.

Before leaving this part of my subject it



ROOF APIARY OF C. H. W. WEBER, CINCINNATI, OHIO.

might be well to mention that my nurseries consist of a long bar about an inch wide, cut to fit tightly between the two end-bars of the regular-sized frame. This bar is partitioned off by tin walls into little chambers about one inch square, and covered on both sides with wire netting, all having the tops left open. When we have cells expected to hatch within a day or so we just take one of these nursery-bars and shove it up under the queen-cells on the frame, thus partitioning each queen-cell off by itself. At the bottom or under side, many corks can be seen which close a $\frac{1}{4}$ -inch hole, the exit to each of these little chambers.

INTRODUCING QUEENS.

To introduce queens I have found this to be the best method for me, excepting none. Take the queen away from the colony into which the introduction is to be made, and the bees will, as usual, start to construct queen-cells as usual. After they are all sealed, and to make sure that they are all sealed, I wait until the 7th or 8th day. By this time the bees begin to expect a new queen from the cells they constructed, and this is the time to introduce your new queen. Put her into a cage; or if she is in a mailing-cage, as she arrived through the mail, all right. Remove the piece of tin which you will find covering a hole at one end of the cage (we will suppose our queen has just arrived through the mail, and the colony was made queenless the day we sent for her—of course time will vary in filling orders, but it usually takes about a week to get the queen), and cover the opening with a piece of thin foundation. After doing this, open the hive and lay the cage on top of the frames, or somewhere between them. Before closing the hive, blow a few puffs of tobacco smoke into the hive, for good luck, and close quickly. The tobacco smoke, however, is not really necessary. In a day or so examine the hive and you will be almost certain to see your new queen on one of the combs, walking along as peaceably as if she had hatched from one of the cells which she only a few hours before destroyed. This method, although keeping the colony queenless for some time, is, nevertheless, one of the *surest*, and is well worth following when a valuable queen is at stake.

Cincinnati, O.

[Our experience in the matter of introducing queens has been almost the opposite of Mr. Weber's. We find that we get bad results in introducing to colonies with capped queen-cells. We succeed much better with colonies queenless but one or two days.

Roof apiaries are not very numerous, chiefly because of the difficulty of controlling the extremes of heat and cold; the only ones I know of who have made a success in such elevated spots are the late Chas. F. Muth, and Weber, as above, and Mr. G. E. Purple, of Chicago. Where land is expensive and can not be had, there is no reason why roofs of buildings may not be made available; but of course it will be necessary to provide against the extreme of heat as Mr. Weber has done. Ed.]



TRANSFERRING.

It is the 14th day of March, and we have had the first day this year in which the weather approached anything nearly warm enough for the bees to fly, the mercury rising as high as 42° in the shade. The snow has been from two to ten feet deep ever since the middle of February, just in accord as the wind has piled it, and the bees that are out on their summer stands are suffering for a fly. Being in hopes that they may be able to fly to-morrow I am out looking at the entrances of the eleven colonies I have outdoors (near sunset), to see that none are obstructed. While doing this I see a man approaching, who proves to be Mr. Brown, who lives about a mile away, and who has the bee-fever, he having purchased a dozen or so colonies of an old box-hive farmer last fall. As he nears the bee-yard I accost him thus:

"Good evening, Mr. Brown. How are the bees getting on?"

"I was out listening at the entrances a little while ago, and I could hear a little hum from all the hives but one, and that I think is dead, as no response was given when I tapped on the hive."

"This long siege of cold and snow has been hard on the bees, but I hope they may fly to-morrow. I see one or two of mine flew a little to-day, but nearly all that flew died on the snow. But it takes only a few bees to make a great show on snow, and I expect the most of those which come out when it is not really warm enough for them to fly are old bees which would soon die any way. Have you looked that your entrances are all free so the bees can fly to-morrow, should it be warm enough?"

"Yes. I carefully cleared the entrances of dead bees yesterday, hoping they might fly to-day, but only a few came out. Like you, I hope they may fly to-morrow. But I came over to have a talk with you about transferring. I have my new hives all made, and want to get the bees into them as soon as possible."

"Are you going to transfer them so as to try to save the combs? or are you going to use frames filled with foundation?"

"I wish to save the combs, of course, as I have only enough foundation to use for starters in the frames for the new swarms."

"Where we wish to transfer the combs as well as the bees, there are only two really favorable times for transferring, although it can be done at any time by using care."

"When are those favorable times?"

"The first is during fruit or apple bloom, and the second is 21 days after the first or prime swarm issues."

"Why those times in preference to others?"

"If done at the commencement of fruit-bloom, but little honey is in the way, so the

transferred combs are more easily held in place in the frames, while honey is coming in sufficiently to prevent robbing, as well as to enable the bees to repair rapidly the damage done the combs. If done 21 days after swarming, there will be no brood in the hives except a little drone brood, so there will be no loss from cutting through it, as all the bees from the eggs laid by the old queen will now have emerged from the cells, while the young queen will have only just begun laying."

"That seems reasonable. But is there no preparation to be made before I begin this work? If so, I wish to make these preparations now, while I have time."

"Yes, there are preparations to be made, and the first is to bore some eighth-inch holes through the center of each frame contained in the movable-frame hive, about four through the top bar, the same through the bottom-bar and side or end bars, if these latter are of equal length with the others. If shorter, then three will do for these."

"What are these holes for?"

"These are to slip pegs or thorns through, into the combs to hold them in place; and your next work will be to make the pegs or gather the thorns. The thorns are best, as they are smoother and sharper. You can find plenty of them on those thorn-bushes over toward the swamp."

"Yes, I know where they grow, and will get some; but there are other preparations, are there not?"

"Yes. Besides having the frames and pegs ready, a board about two feet square will be necessary, and a barrel or box of convenient height for the operator to place the board upon. On one side of the board should be tacked three or four thicknesses of cloth so the brood and combs will not be injured by being placed upon it. Besides these you will want a long thin-bladed knife."

"That completes the preparations, I take it."

"Yes; and, having these things in readiness, proceed to the hive and blow a few puffs of smoke in at the entrance to alarm the bees, when the box hive is to be turned bottom up and the frame hive placed on the stand the box hive occupied. Blow a little more smoke over the exposed bottoms of the combs, and place the cap of the hive, or any box, over the bottom of the hive for the bees to crawl up into. Select the side of the hive to which the combs run parallel, if possible, and proceed to pry off the side, using a cold chisel to cut the nails, if necessary. If there are cross-sticks through the center of the hive, these must be cut off with a saw, or otherwise."

"What becomes of the bees?"

"By this time the bees will all be off the combs next to you, when the first one is to be cut out and laid on the prepared board. Now lay one of your prepared frames on this comb, and mark the comb by the inside of the frame. Next, take off the frame and cut the comb a hair larger than the marks, so that it will fit snugly in the frame, when the frame is to be pressed over the comb until it fits nicely. The thorns are now pushed through the holes into

the comb so as to hold it in place in the frame when hung in the hive."

"Will these thorns hold it all right in picking up?"

"To take from the board requires a little skill, as the comb is generally stuck fast more or less with leaking honey. But if the board and all is raised until the frame stands in the position it hangs in the hive, there will be no danger of the comb falling out in causing it to part with the board. When free from the board, place the frame in the hive, and the bees which have returned from the fields will take possession of it, licking up the drip, etc. Proceed to cut out the rest of the combs and fit them in the frames as you did the first, until all are used, and set in the new hive, placing them in this hive in the same relative position, as nearly as may be, which they occupied before."

"What about the drone comb? Should there be much?"

"If drone comb to any amount is found, it is well to leave the most of it out."

"How about the smaller pieces?"

"If many pieces of nice worker comb are made by the combs cutting to a disadvantage, they can be fitted into frames, and fine wire wound around to hold them in place till the bees fasten all together. If this is done, the hive must be opened in a few days and the wire removed. The thorns can always remain, as they do no particular harm."

"How about the bees which have run up into the box?"

"As soon as all the combs are in, close the new hive and hive the bees which are in the cap or box into it, the same as any swarm would be hived, when the job is done. If a scarcity of honey exists at time of transferring, so that robbing is liable to occur, a bee-tent to set over the hive and operator is a good thing."

"You spoke at the start about using foundation in transferring. What did you mean?"

"We have at the present time what is termed the new way, or Heddon plan of transferring, and many of our best apiarists prefer that to the old way."

"How is that different from the one you have just told me about?"

"By the new way a new hive with the frames filled with comb foundation is set on the stand the box hive occupies, when the queen and three-fourths of the bees are drummed out and hived in the new hive, the old hive being left standing close by. In a week this old hive is carried to a new stand, this stopping all after-swarming by causing all of the flying bees to be left with the new hive. In 21 days, when all the brood has emerged from the cells, and the young queen commenced to lay, all of the bees are driven out, and from the combs and old box hive, and this drive hived in another new hive standing on the stand the box hive occupied just before this last drive. You have now two colonies from your old one that was in the box hive, both of which are in new hives with all-worker combs, while you have the contents of the box hive all free from bees, in a shape that

you can do what you please with it. Most of those using this new method prefer to put the old combs from this box hive into the solar wax-extractor, thus getting out the honey and wax from them, and separating the same so it is in fit shape for use."

"Well, this plan sounds nice, and had I the foundation I think I should prefer it to the other. But it is nearly dark, and I must go back. Good night."



BREAKING THE RECORD; 27½ TONS OF HONEY BROUGHT INTO ONE APIARY IN ONE SEASON.

I want to furnish an item for A. I. for GLEANINGS. In the Mar. 1st number, page 198, he says: "More than 22 tons of honey was brought into that one spot in one season, and all collected from flowers within range of the bees' flight. Can the world furnish a parallel?" (From 680 stands) You send GLEANINGS to Bart Bartlett. He, one brother, and a brother-in-law, work under its firm name of Bartlett Bro. & Merkly. A year ago this spring they came through with 160 laying queens, and from those queens and their increase, in one yard, in one season, they extracted 55,000 lbs. of A No. 1 white honey, or 27½ tons. Now, this is what I did last season, in one yard of 152 colonies. I extracted 42,000 lbs.; but on account of sickness I got behind and lost one extracting of 7000 or 8000 lbs. Now, can you beat that?

Vernal, Utah.

C. C. BARTLETT.

[Friend B., I am exceedingly obliged to you for the item you furnish, especially as a much smaller number of colonies did the work. You say 160 laying queens. These queens probably all had exceedingly strong colonies, and there might have been some queenless colonies to help out—probably not, however, the way you state it. This would be over 343 lbs. per colony, spring count. It would be interesting to know what the increase was. If the firm can give us further particulars in regard to the matter we should be very glad indeed to get them; and I suppose a good many of our readers would like to inquire whether there is unoccupied territory in your vicinity that will give any such yield as this. And you, my friend, did a wonderful thing also. If we take into consideration the 8000 lbs you lost, then your bees brought or might have brought into that one spot 50,000 lbs., or 25 tons. This amount, from 152, spring count, would not be quite equal to the former, but a stupendous achievement for all that. Now, instead of stampeding to Wewahitchka, hadn't we better turn about and investigate around about Vernal, Utah? I think your locality must be well named, friend B. Rest assured, if I ever make another trip to your State I shall try to hunt you up.

Mr. Calvert tells me that your honey was probably from alfalfa grown by irrigation. He also adds you are something like 125 miles from any railway station. How do you get this great crop of honey all this long distance in order to get a market for it?—A. I. R.]

CLIPPING QUEENS; HOW MANY AND HOW MUCH OF THE WINGS SHALL WE CLIP?

On page 838, Nov. 1, S. E. Miller says: "I am a little surprised by a late number of GLEANINGS to see that you and Dr. Miller do not know the correct way to clip a queen's wings, so I suppose I shall have to tell you both, as well as the other readers of GLEANINGS."

Now, Mr. Editor, as I am one of those readers you will surely give me a chance to protest against any such way. I have clipped a good many hundred queens—about 100 the past season, and I want to say that, if Bro. Miller's object in clipping queens is to keep them from flying, it is positively unnecessary to clip more than a third of *one* of the large or top wings, and that a small pair of sharp and pointed scissors is the proper thing to do the cutting with. The position of the knife across the wings in the illustration covers the four wings just above, so that the sight of Bro. Miller's queens with four stubs and a naked back can more easily be imagined than admired; but the single-wing method of clipping leaves that side of the wings apparently rounded off by the perfect or lower wing, which is a little shorter than the top ones.

Manistee, Mich., Feb. 4. W. HARMER.

[Referring to the article on page 838, last year, it is evident that you misunderstood the doctor and myself. We have not recommended that all four of the wings be cut off, leaving "mere stubs." The plan illustrated contemplated cutting only the two wings on *one side*. If the other two are left intact, the deformity is not so very noticeable.

You claim "it is positively unnecessary to clip more than a third of *one* of the large or top wings." Are you sure about that? Why, friend Harmer, I have seen queens fly when clipped as you describe. They will fly just far enough to get clear away from the hive, become exhausted, drop down, and get lost. Possibly they will crawl into some other hive where they will be destroyed. We have also had quite a number of reports where this scant clipping of one wing has resulted in a whole swarm of bees getting away with the queen. To make sure, it is better to cut quite close the one large wing, or cut both wings about half way up on one side.—ED.]

A CORRECTION.

Mr. E. R. Root.—In commenting on Prof. Rankin's article on page 84, you are mistaken in saying that these are the same bees mentioned on page 924. The only bees of which both Prof. Rankin and yourselves had a sample were those mentioned on page 844 of the Nov. 1st issue.

J. H. GERBRACHT.

Spring Grove, Ill.



NATIONAL BEE-KEEPERS' ASSOCIATION.

OBJECT:—To promote and protect the interests of its members; to prevent the adulteration of honey.

OFFICERS:—E. R. Root, President, Medina, O.; B. C. Aikin, Vice-president, Loveland, Col.; Dr. A. B. Mason, Secretary, 3512 Monroe St., Sta. B, Toledo, O.; Eugene Secor, General Manager, Forest City, Iowa.

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FEES:—Annual membership fee, \$1.00. Remittances may be sent here or to General Manager as above.

GENERAL MANAGER SECOR has lately issued a pamphlet, giving the objects of the National Bee-keepers' Association and also the constitution. I presume a copy of this will be sent to any one who may apply. Those who are not members should know something of what this organization is and has been to bee-keeping during the last fifteen or twenty months, and what it proposes to do in the future.

So far the reports of wintering have been generally favorable, although there is one report from Wisconsin that seems to indicate that in that section, at least, there will be 50 per cent loss or more. The season generally will be late. It has been running all the way from cool to cold, with very little warm weather for brood-rearing. This, fortunately, has kept brood-rearing down, so that the bees have not wasted their strength before actual warm weather comes on.

"THE AMERICAN GARDENING" ON THE QUESTION OF BEES PUNCTURING FRUIT.

IN the above-named publication for Feb. 9 there is an article headed "Do Bees Puncture Fruit?" It seems that one B. L. Ryder, in the issue of that paper for Jan. 12, intimated that bees were guilty of "puncturing and feeding on our finest peaches." This was vigorously denied by Mr. R. E. Huntington, who, among other things, said it was "painfully evident that the writer has not read up much on that subject within the last five years." He also referred to the findings in the case of Utter v. Utter, at Goshen, N. Y. The editor of the *American Gardening*, in commenting on this, while not assuming to deny or affirm that bees may puncture fruit, yet says, "The balance of evidence, as we see it, is proof in favor of the bees, and the little insects are honorably acquitted by the editorial court." He also refers to the experiments that were conducted at Aurora, Ill., where the bees were confined in a building where there was an abundance of sound fruit; and yet, although brought to a condition of hunger, thirst, and starvation, they could not be induced in any instance to attack the fruit unless it was first punctured.

Besides all the bee-journals, the little bees have on their side such stanch advocates as the *Country Gentleman*, the *Farm Journal*,

American Gardening, and a good many others. Truth is mighty, and bound to prevail.

THE NEW FOUL-BROOD LEGISLATION IN MICHIGAN.

I AM pleased to announce that the foul-brood bill which passed the Senate of the Michigan State Legislature has now gone through the House, and at last advices were awaiting the signature of the Governor. If he signs it, as I presume he will, the bill will become a law. Great credit is due to the Hon. George E. Hilton, a former member of the lower House, and who, by the request of bee-keepers, engineered the measure through both Houses. Several times the bill would have been "amended" or "shelved in committee" but for the energetic promptness of our old legislator who insisted on having just what the bee-keepers wanted, *and he got it*.

This piece of legislation was enacted none too soon, for foul brood has of late been making fearful progress through the State. The old law, now superseded, was defective in that it did not provide for a competent State inspector under the pay of the State. The bee-keepers of Michigan can now select the best man available; and such a man, if he be like the inspectors of Wisconsin and New York, will see that a sudden check is placed upon the further spread of the disease.

SPRAYING TREES IN BLOOM; MORE EVIDENCE AGAINST THE PRACTICE.

I HAVE already reported that the Experiment Station at Geneva, N. Y., counseled against spraying trees while in bloom; that it not only killed the bees, but also affected the delicate organs of the flowers; that in some cases those who had been most active in urging spraying during blooming-time had found to their sorrow that such spraying had seriously cut down their fruit crops. While these experiments were being conducted at Geneva and in that vicinity, the same kind of experiments were being carried on at Cornell University, N. Y.; and now we have a report from John Craig, of that station, *confirming the findings of the Geneva station*. This report is published in the *American Gardening* for April 6.

It has been urged by the advocates of spraying in bloom, that, during seasons like that of 1900, when the trees are heavily loaded with blossoms, spraying at such times has the effect of thinning away the superabundance of fruit. Regarding this, Mr. Craig very pertinently says: "It seems that, when this admission is made, the strength of the argument is very much weakened. If it is a thinning process, then it could be practiced with safety and advantage only in seasons of heavy bloom." Elsewhere he says, under the head of "Disadvantages of Spraying while in Bloom," that that the "researches at Cornell and elsewhere have indicated that the copper salts are very injurious to tender tissues; and that, the more delicate the structure, the more likely is injury to ensue. . . . The thinning which follows spraying trees in bloom is probably

due to the injury to the pistil or stigmatic surface by the fungicide." Mr. Craig then mentions another objection to spraying in bloom; viz., the "destruction of the bees;" and then, in giving a reason why such destruction should not take place, he says: "When cross-pollination is carried on by the bees, larger fruit will be secured than if self-pollination occurs. . . Now, if we cover our apple-blossoms with mixtures which are likely to poison the bees, it seems to me that we shall be using against ourselves a double-edged weapon." When it is remembered that these experiments were begun at the Geneva and Cornell stations at the instigation of the fruit-men, who were anxious to prove that spraying during blooming-time was an advantage, the results, being just the reverse of what was expected, are all the more valuable.

MISS MORLEY'S HONEY-MAKERS.

IN looking over the many different bee-books on our list it would seem that the field is pretty well covered. The beginner, by studying Langstroth, may make himself acquainted with all the different phases of bee culture. The more advanced will profit by reading Heddon's "Success in Bee Culture," or by following Dr. Miller for a year. The student can satisfy his thirst after knowledge by perusing the pages of Prof. A. J. Cook's "Guide;" the queen-breeder or the experienced honey-producer wishing to breed his own queens will find Doellittle's book on queen-rearing just the thing. The A B C of Bee Culture is an encyclopedia for all, the beginner and experienced. So I might go on and name many other good bee-books.

Miss Morley, in her late book, "The Honey-makers," fills a vacancy which the honey-producers have not felt. But the laity will be pleased that this vacancy is now filled, for the book is especially adapted to the non-bee-keeper, although this does not imply that the professional may not learn from it. The illustrations, particularly those of the external organs of the bee, can not help making it clear to even those who know nothing about this wonderful insect, what the organs are for, and how they are used. The whole book is written in such a pleasing, unique, and fascinating style as to lead the reader on and on so he will not rest until it is read clear through.

The first chapter gives a general outlining of the structure, habits, products, and mission of the honey-bee. The next 20 pages are devoted to the bee's tongue, which at present receives so much attention from the bee-keepers. The illustrations of this organ are so nearly perfect as to give the reader a very clear conception of the workings of this wonderful organ through which all the honey, stored for us, must pass. Chapter 3 describes eyes, antennæ, and brain; chapter 4, the wings; chapter 5, the legs. The reader will be informed that the six legs of the bee are not so many sticks to prop up the body of the bee, but that each one consists of many parts, forming a very complicated piece of mechanism, intended for various uses.

After the external organs are described, the writer makes the reader acquainted with the inner organs. Then the different members of the bee-family are described; further on, the whole as one family.

The different uses of honey in this and other countries are explained; many wonderful things are told regarding the customs of the ancients in the line of using honey. Many extracts from Hindu bee-literature, and that from Egypt and other eastern countries, are given. Much space is devoted to showing what knowledge the Greeks and Romans had of the physiology of the honey-bee.

The book will be an ornament in any library. May it find many readers, and thus disseminate bee knowledge among the general public. It may be the means of dispersing prejudice, and establishing a better feeling between the bee-keepers and those who can see in the bee only a disturbing element.

This book is published by A. C. McClurg & Co., Chicago. It contains 400 pages, well illustrated, and the price is \$1.50. It can be supplied from this office.

DAVITTE'S TENT FOR CONTROLLING THE MATING OF QUEENS.

IN our issue for March 15, page 247, I described the Davitte method of controlling the mating of queens, as given in the February issue of the *Bee-keepers' Review*; and through the courtesy of that paper I am able to reproduce that illustration showing the fertilizing-tent that Mr. Davitte recommends, and described by him as follows:

I would secure 12 tall poles. I would have them at least 30 feet long—40 would be better. These I would plant firmly in the ground, 12 feet apart in a circle. From pole to pole, at the top, I would stretch No. 10 wire to keep the poles true and in place. I would also brace the poles from the inside; and the braces would be allowed to go up 20 feet on the inside, as the drones use only the upper part of the tent. At the top of the poles I would also stretch No. 10 wire from each pole to its opposite neighbor, thus strengthening the structure and furnishing support for the covering that goes over the top. I strengthen every seam of my netting by stitching on a strip of bride-rein stuff about an inch in width. This allows me to stretch the covering very even and tight without tearing it. Common boards can be used around the bottom to the height of five or six feet. At noon the tent should have the appearance of a sun-palace.

The secret of success, according to Mr. Davitte, lies in keeping the workers out of the cage, as they have a tendency to annoy drones. As I explained in GLEANINGS, this is accomplished by placing the hives around the tent as shown in the cut, each hive having two entrances, one communicating with the inside of the inclosure, and the other out-doors. The former is closed several days, or until the workers become thoroughly accustomed to the outside entrance, and then is opened to admit the drones from 11 o'clock till 1:30. After a little the drones begin flying inside of the inclosure, forming a "school" in the air, and, nine times out of ten, they will, according to Mr. Davitte, meet the queen on the wing before she reaches the top of the cage.

But the tent proposed by Mr. Davitte is

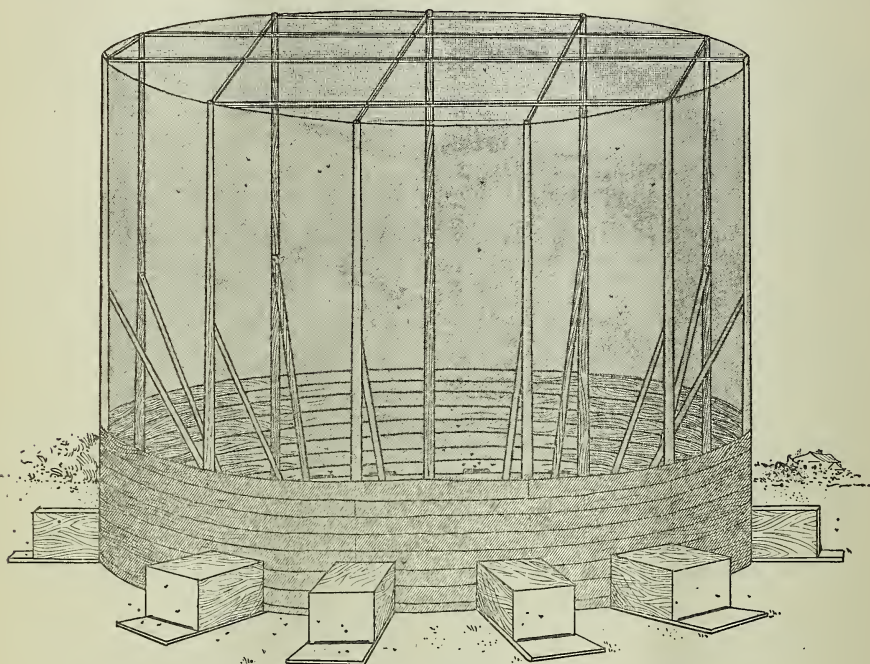
very large and expensive, and one must have reasonable assurance that such a structure will accomplish the result desired before he can afford to put one up. While I believe it will work, is it not possible that a smaller tent will do?

Mr. Thaddeus Smith, of Pelee Island, Canada, calls my attention to an article written by W. R. King, in the *American Bee Journal* for 1872, page 177. In this article I find that Mr. King employed practically the same principles recommended by Mr. Davitte, *except* that his fertilizing-house was only 6x8, and 8 feet high. This structure was boarded up two feet from the bottom, then covered the rest of the way up with cloth. The top was surmounted by a cone-shaped calico roof.

He says he succeeded in having "many queens fertilized last season by the foregoing method, carrying out every manœuvre just as I have presented them." But he scouts the idea, which at that time was being talked of a good deal, of the possibility of queens being fertilized in the hive. He says: "When any man tells you he has had queens fertilized in the hive, and four at a time, just tell him for me that he says—what's not true."

As soon as the weather opens up, and we can get drones, we will try the small house; then if that will not do we will try the larger structure.

There are several other old articles on this subject of fertilizing in confinement if one wishes to pursue the subject further. One



MR. J. S. DAVITTE'S TENT FOR CONTROLLING THE MATING OF QUEENS.

Mr. King, in several places in the article referred to, emphasizes the importance of keeping the workers *out of the fertilizing-room*. He considers this so important that he has put the statement in one form or another in several places in italics.

But his manner of keeping workers out of the tent was somewhat different. He put young drones, that had never flown, on some frames of hatching worker-brood. These frames were confined in a wire-cloth cage over a strong colony for four or five days. The drones were then released in the aforesaid room together with young queens of the right age. As the workers were too young to fly, Mr. King says none but drones and queens would be in the air. And now for results:

was written by G. M. Doolittle March 11, 1871—see the *Amer. Bee Journal* for that year, page 258. On the same page, and the one next following, are two more articles on the subject—one from Mr. R. M. Argo, and another from L. L. Langstroth. In the same issue there is an editorial on the subject by Samuel Wagner.

It is well to remember that, a few years after these articles were published, the idea of having queens fertilized in cages, or in confinement, was regarded as a universal failure; and the probabilities are that we to-day shall meet with no better results; but in a matter of such importance as this I believe that we should grasp even at straws; for peradventure we *may* in these later days meet with success.



Thou shalt not covet thy neighbor's house, thou shalt not covet thy neighbor's wife, nor his manservant, nor his maid-servant, nor his ox, nor his ass, nor any thing that is thy neighbor's.—Ex 20:17.

Our pastor, Rev. Jesse Hill, has been giving us a series of sermons on the ten commandments. I heard the first of them before I went to Florida, and I was fortunate enough to catch the last after my return home. In the outset he surprised and somewhat startled me by remarking that God gave us nine commandments in regard to our actions—thou shalt *not* do so and so. The tenth and the last is the only one that presumes to dictate to humanity what its thoughts shall be. This much, or this suggestion, is from my pastor. The rest of my talk may include something of his sermon, but will be mostly on a line of my own.

Most people would say one has a right to *think* about what he pleases, or, in other words, it is nobody's business what you think about or what your thoughts are. But this commandment teaches us that God, the great Father above, has really undertaken to tell us what we are permitted to think and what not. Of course, we may say we are going to think what we please, no matter what the Bible says or what the ten commandments say. We may do this; but if we do, then we must decide we are not in obedience to the great Father, and that we are not one of his people—certainly not his obedient child.

I confess it has troubled me almost all my life to understand the expression so often brought up from Holy Writ, that we are *all* sinners; but when I come to think we may sin in *thought*, without doing any thing else at all, then I begin to comprehend that humanity as we find it is really born in sin and born to sin. In fact, Job tells us that "man is born to trouble as the sparks to fly upward." If the word "trouble" may be understood to mean evil, I think I shall agree with Job.* If evil thoughts never went any further than just *thoughts* alone, no one would be particularly harmed, except, perhaps, the one who does the thinking; but we all learn the sad fact, sooner or later, that evil thoughts are only the commencement or *start* of evil actions. The thief, the robber, the murderer, must go through a series, and sometimes a long series, of evil thoughts before these thoughts ever ripen and blossom into crime. The sin of covetousness is an index of character. It soon begins to pervade the whole person. It is a low-lived, low-mannered, ungenerous, disgraceful sin. Oh how many times I have seen it lead even young people astray! I have seen jealousy get a lodging-place in the hearts of even chil-

dren. I have seen it get so dominant it seemed an almost utter impossibility to make the sufferer see the source of all his troubles. The young people in our employ sometimes come to me and complain that others are getting more pay than they, when they (the speakers) do nearly twice the amount of work. After having heard their version of the case I often say, "Why, my young friend, you are letting this thing that has got into your heart not only make you unhappy, but spoil your value." Then I explain to them as well as possible the mistakes they are making in looking with a jealous eye on some bright, happy, wideawake, go-ahead fellow-workman.

Jealousy and covetousness *blind* people. A man once said to me, "Mr Root, your own observation must have convinced you that I am doing more work for the pay I get than any other man in your establishment." Now, this poor foolish man had been looking with jealous eyes at A, B, and C, and comparing them with himself; and Satan had whispered to him that he was smarter and more useful to the business than any one else there, and that he was getting less pay than any one of them. The only way I could convince him of his error was to advise him to get a job somewhere else with somebody who had no prejudice against him in the way he insisted I was prejudiced; for, to tell the truth, he was, perhaps, the most unprofitable man I had at the time.

But this covetous spirit does not end here. Again and again it has urged people on to crime—yes, women as well as men; and many a time the guilty one has excused himself by saying, when he found out there was no chance of getting what he had justly earned, he took the liberty of appropriating what he thought would make it "about right."

But when Satan succeeds in getting into a man's heart along the line of this tenth commandment he does not stop with the pretense of making things *fair*. Yesterday's paper told us that in the neighboring town of Chardon five men broke into a bank in the night. They bound and gagged the night watchman, and then did the same thing to a physician who was out late at night. They threatened these two with instant death if they tried to get away or made the slightest noise. I do not suppose they pretended to justify themselves in what they were going to do. In blowing open the building and the safe they used a dozen or more charges of nitro glycerine. Of course, the citizens were awakened, and attempted resistance; but these five men, armed to the teeth, held them at bay. They retreated under a fusillade of bullets, got away on a hand-car, and escaped. They took their lives in their hands, and at a terrible risk; or, we might say, with terrible odds against them—in fact, with a probability that one or more of them would be killed, they wrecked the best buildings in the town, and actually blew open one of the best safes that is made in the world. They did not care how many lives they took; they did not care how many fine and expensive buildings they wrecked. They did not even care if the money they coveted was the

* Paul throws some light on this matter in an expression I never understood until just now, which we find in Romans 7:7: "Nay, I had not known sin but by the law; for I had not known lust except the law had said, *Thou shalt not covet.*"

earnings of poor, honest, industrious people. Had somebody told them this money belonged to poor women, say teachers and widows (perhaps *washer-women*), if they gave an honest answer they would have replied, "That does not make any difference to us. We do not care whose money it is nor how they came by it, nor how much suffering the loss of it would occasion. We have no regard nor care for anybody. We want money, and we are going to have it, no matter who is wronged and injured and made to go hungry."

As I write, three men have been arrested, whom there is good reason to believe are a part of the guilty five. Of course, they do not admit their guilt at this stage of the proceedings. Later on they may admit it. Sometimes such men confess their crime. If such a man does make an honest confession I'd like to ask him to tell me honestly and conscientiously what use he intended to make of the money—what caused him to long for something that belonged to somebody else to such an extent that he would risk life, reputation, and every thing else to get it. I never had a chance to ask a criminal such a question; but from what we can learn through the papers, of this class, I am led to believe it would be that he wanted it for tobacco, drink, and gambling. I believe these men usually lose the greater part by gambling in a short time. Drink and like excesses are *too slow*. Satan must furnish some way in which this money which cost so much can be sunk in an hour or a minute.

Sometimes we say, in considering the number of terrible crimes like the one I have mentioned, that there is only one man in thousands who would do such a thing, and that there is only one in a great many thousand who really *wants* money that belongs to somebody else. Oh dear me! I wish this were true. Even though the bank-robbers get caught, and a large part of them sent to the penitentiary, it does seem to me as if this thing were growing. A few get off scot free, with large booty; and this encourages others to undertake similar work.

Let us now think of a good man in contrast—a man who has been scrupulously honest and upright—yes, one who has been generous, and ready to divide his honest earnings, oftentimes, with people who are lazy and shiftless—that is, when he finds them in trouble. Let us contrast the good man—or shall we say the Christian man?—with the robber. What an enormous gulf lies between the two extremes! In a little tract sent out a few days ago, the story was told of some soldiers in olden time who were out on a march during a fierce blizzard. A larger part of the company died through starvation and cold. Their gallant and courageous captain, who was greatly beloved by the remnant of the little band, finally told his men they would have to give up; that for his part he would have to lie down and sleep, even if he knew that that sleep was death. He went to sleep, and, as he supposed, so did his few faithful followers. But after he lost consciousness these few men deliberately stripped themselves of their clothing, placed it over and under their captain so

that he awoke to life in the morning. But the first thing that met his gaze was the sight of his comrades frozen in death. They stripped themselves, and died, that he might live, even as Jesus deliberately chose death on the cross, the helpless victim, as they supposed, of his persecutors. He died that they might live. Now, we know that all through the ages there have been cases like this. Not only mothers but fathers have cheerfully accepted death that loved ones might be saved. Every little while we see illustrations of how some good generous soul suffered and died for the sake of some one else—sometimes, but rarely, even to save an enemy.

Yes, there *is* something Godlike in humanity. There is something grand, unselfish, and noble. Sometimes we find exhibitions of this unselfish and noble attitude of heart, even where we least expect it. Now contrast it, if you please, with an unfeeling, selfish criminal. These cases of terrible depravity are often found among the tramp classes. It was suggested that the affair at Chardon was the work of a gang of tramps. Skeptics have railed at the passages in the New Testament, describing a state or stage of humanity where Satan holds possession—demoniac possession, it is sometimes called. How can any thing else explain the awful depravity of some human beings alive at the present day, except that Satan has entered into their hearts and obtained *complete possession* and control, driving out every thing else? These tramps or ruffians would strike down a refined and intelligent woman just to get her pocketbook. They would strike down an honest hard-working mechanic, or perhaps maim him or send him to the insane-asylum for the rest of his life, just to get possession of a few dollars of his hard earnings. Yes, and may God help us, there are *worse* people in this world of ours; yes, even now at the very commencement of this new century, than any thing I have described. Let us go back to our text:

It says, "Thou shalt not covet thy neighbor's house." This means that you must not become envious of somebody who has succeeded in getting a better home than yours, even if a chance should offer so that you could legally drive him out and get his fine home for yourself and family. You would not think of doing it. But the next sentence in the text tells us, "Thou shalt not covet thy neighbor's wife." I hardly need call attention to the fact that just now there seems to be a mania for striking down unprotected women—that is, where they can not be rendered helpless otherwise, simply that these wretches I have been describing might minister to a passion that *surely* had its origin in the bottomless pit. Of course, swift punishment has been meted out by an indignant public; and let me right here point to one result this swift punishment, without judge or jury, has brought. The criminal *now* recognizes that, if his victim lives to identify him, he will be strung up to the nearest tree, or burned at the stake; therefore of recent date this man, be he white or black, who is possessed of that particular spirit of evil, finishes up as a murderer.

A few years ago our courts at law dealt with a crime called rape. But that is gone by now, or is fast going by. In its place we have "assault and murder." A jury trial, even if it resulted in hanging or electrocution, would be less likely to urge the criminal to add murder to his other crime.

You may say, in extenuation, that those who commit this new form of crime are the offscourings of humanity—they do not deserve to live, and the best thing the world can do is to kill them off as soon as possible after they are once spotted. I presume the people who recommend this sort of treatment would have them shot as we shoot mad dogs, without any more scruple, and for the same reason—to protect innocent people engaged here and there in honest industry and employment. Let us see about this. I have alluded to the case of Jennie Boschiter, the factory-girl who was murdered in Paterson, N. J., last summer. In this case the murderers were not the offscourings of humanity like mad dogs or something of that sort, but they were four so-called respectable men. One of them was the husband of a young wife, and recently married. These four men claimed that they did not mean to *poison* the girl. But will somebody tell us which was to be preferred—death, or such a life as would have remained for her to live (supposing they had done as they planned) had it not ended in death? And then there is an intimation in that awful detail, as the papers gave it, that that was no *new* thing with those men or that class of men if you choose. They were in the habit of finding some unprotected factory girl—one who had no father or big brothers, for instance, say some widow's daughter, and drugging her, and, if she did not die, thinking it was only a small matter.*

By the way, some very good people, or people who call themselves good, criticise this old Bible of ours by saying there are many things in it that had better be left out. I do not know but I have heard people say

* Thank God that this terrible crime seems destined, not only to wake up the men of our land but the women also. See the following, which we take from the last number of the *American Issue*:

Found the Paterson, New Jersey, episode, whereby one young woman was lured to her death and four "society" dissolutes found guilty and sentenced to the penitentiary, three for 30 years each and one for 15 years, is bearing fruit in the city of Trenton, in the same State.

At a meeting of the Business Girls' Club, one young woman declared that "if the gay young men of this city want wives, they must give up beer," and following this announcement 97 girls signed the following pledge:

"I hereby promise not to keep company with or marry any man who is not a total abstainer from the use of all intoxicating liquors, including wine, beer, and cider; and I promise to abstain from the same myself. I will not marry a man to save him."

Says the Youngstown *Vindicator*:

"The young women who signed the foregoing pledge represent every class of educated bread-winners, and a large percentage of the really desirable girls of the city. The Paterson sensation and several similar, but not fatal, cases here, led to the meeting that resulted in the promulgation of the pledge.

"The young men about town take the matter seriously, and several engagements were put in the balance by the movement. It is expected that at least 300 young women will sign the pledge.

"Should the formation of such societies, and pledge-signing, become an epidemic, and spread over the country as did the old Washingtonian movement years ago in the cause of temperance, there would follow a falling-off of revenue to the government in the sale of brewers' stamps."

that this tenth commandment is all very well as it reads about the neighbor's house, servant, live stock, etc.; but that there is no particular need of shocking everybody and making it unfit for children, by putting in that clause about the neighbor's wife. To me it is something wonderful to think this old Bible fits and *hits* the state of affairs century after century as the years go by. The words, "neighbor's wife," are, of course, intended to cover his daughter (*especially* if that daughter be only a *child*), his sister, or mother, or any family relative. The crime of this century—perhaps I may say the *entire crimes* of the new century—is the outcome of violating this tenth commandment. The breaking commenced away back. When our dailies give us the details of crime we almost always say, if we look carefully, that the thing started away back. The man became greedy and over-reaching. He got among bad companions. He became hostile to Christian people and to Bible teachings, especially the ten commandments—perhaps we might say the *tenth* one. For a time he tried to excuse himself, but finally he gave himself wholly over to Satan; and if he had a little success to encourage him, say in the way of legal robbery, he finally and deliberately plans running away with something belonging to the best friends he has in the world; and then it is but a step further, especially when nobody will trust him with any thing, to plan to blow up a safe so as to get the tax returns that hard-working farmers have brought in in little dribs—brought in to supply a fund for schoolhouses, good roads, public improvements, and every thing that is conducive to the best interests and happiness of humanity.

I have not touched on men in public office who turn traitor to their constituents, and accept bribes, or purloin the money that community at large has intrusted to their care. Peter once said to Simon the sorcerer, "Thy heart is not right in the sight of God;" and it has occurred to me again and again that these people who prove recreant to the trust imposed on them by the people were like poor Simon. Their *hearts* are not right in the sight of God, and perhaps *never have been*. I presume I have said enough about tobacco, drink, and gambling; but may I be excused for saying right here that, if we could or would put men into office who could not be induced either to *smoke, drink, or gamble*, we should have better times all around? But what a terrible uproar it would make if such a thing were undertaken—yes, even in Kansas! and may God bless the Kansas people, even if they *have* "gone too fast" or too far in the way of reform, as some of the wise (?) editors of the great dailies tell us. I want to confess that, so far in my life, I have, by some strange omission, neglected this tenth commandment. It seems just now, as I read it over and over, that obedience to this one commandment *alone* would Christianize the world, or at least give it a terrible cleansing, if it did *not* lead all mankind to the feet of Christ Jesus, the Lamb of God that taketh away the sin of the world.



Taking up my travels from where I left off in the last issue, after we got well out of sight of the old castle, my companion, Mr. Brown, commenced something like this:

"Mr. Root, did the mail-carrier say any thing to you about my house being haunted?"

"No, he did not mention it; but while I was looking it over on the evening of my arrival, waiting for you to come home, I made up my mind that something of this sort was at the bottom of finding such a place away out here in the wilderness, so thoroughly equipped and furnished with every thing."

"Well, Mr. Root, since you are not likely to go back there again, at least not right away, I think I shall have to tell you that a great part of the people around here could not possibly be induced to step foot into that house, especially to go in after nightfall. Some years ago the owner of the place was found dead in that same house, under very peculiar circumstances."

"What did he die of?"

"Well, he died in the very room you occupied last night, and, as nearly as we can make out, of the very same trouble you had, or something very much like it."

"Look here, Mr. Brown, this begins to sound a little supernatural. What sort of a man was he? What were his habits?"

"Well, to tell the truth he was an intemperate man, and the wine-cellar and its contents might have had something to do with it."

When I was in such distress the night before, it *did* occur to me that Dr. Dowie says all sickness is of the Devil; and I confess it was an easy thing to imagine that Satan then had me in his clutches for sure. In any case, my earnest and honest prayers to Him who has been casting out Satan ever since the beginning of the world were not, in my case, out of place.

I said Mr. Brown was located away out in the wilderness. Well, so he is. But after driving through the woods a little more than a mile we came in view of one of these sudden contrasts that are often met in Florida. It was a beautiful oasis, not in the desert, but in the wilderness. Years ago a canal was projected, and quite a good deal of money spent in cutting it through the swampy lands, with the view of running boats clear up to Palatka. The project was carried out until the canal extended some little distance beyond Bulow. Well, on the side of this canal Mr. Knox has planted not only some fine orange-groves, but has built one of the most beautiful residences in Florida. I had to rub my eyes and look again to be sure I was not dreaming when I first caught a glimpse of the beautiful place. Where every thing else all around was woods, swamp, and the home of the wild fowl and the waterfowl, all at once we find a beautiful home with all modern appliances. The green lawn dotted with rare and beautiful exotic

plants—plants that brought forth exclamations of surprise at every turn—seemed too pretty to be reality.

As this locality is subject to frost, many of the plants were protected with cotton cloth, boxes made of light wood veneer, and some of them with neat structures covered with oiled paper. And here I commenced getting my first ideas in regard to protection from frost in Florida. Of course, since the severe freeze of six years ago many experiments have been made. I was astonished to hear Mr. Knox tell me, as others told me repeatedly afterward, that cotton cloth alone, even in the form of a square box or tent, is no protection from the frost whatever—in fact, that trees are often injured worse under the cloth than those with no protection at all. With the tent or box, or any such covering, there must be at least a little artificial heat inside, and the cheapest way of furnishing this for individual trees is coal-oil lamps or a cheap form of lamp made especially for protecting trees of different sizes. Another thing, there must be a ventilating-hole at the top. Where one has, say, an acre of trees to look after, he can not very well examine each lamp every hour to know the temperature; and sometimes more harm is done the trees by too much heat than by too little. Now, aside from quite a good-sized orchard where each tree had its own box or tent, Mr. Knox has one solid acre under protection. Around the outside is a tight board fence 18 feet high. Overhead are cloth curtains supported by a light framework of wood and galvanized wire. The cloth is in strips, say six or eight feet wide. Well, by suitable mechanism each strip of cloth is pulled up or shoved up together so that the top is virtually open to the sky. Now by a suitable mechanical contrivance these cloth strips can be spread out or gathered up in four or five minutes, simply by the power exerted by one man. This one man winds the wire on a sort of capstan by walking around as a horse goes around in an old fashioned cider-mill. Now, inside of the one-acre shed there are piles of dry wood; and when the top is closed, or nearly so, by spreading out the cloth strips, a very little fire at different points inside of the shed will raise the temperature so as to hold in check effectually any freeze yet known in Florida. Mr. Knox said this structure was going to cost him, if I remember correctly, something over \$1000. W. S. Hart, at Hawks Park, who lives quite a way further south, has something similar that cost less than half as much.*

At this place, Bulow, I first saw an arrangement for making the artesian water pump water of a better quality. Most of the artesian water tastes strongly of sulphur and sometimes of other minerals; but the volume

*As we get further south, instead of a covering overhead that can be opened and closed they make simply a slatted roof, say a three-inch slat and then a three-inch space. Sometimes the space is made narrower than this. Well, these slatted roofs with a little fire inside answer every purpose, and the expense of constant manipulation of the overhead covering is saved. In a future issue I will give some pictures of a similar arrangement, although on a smaller scale, for covering pineapples.

is so great it is an easy matter to have it run a water-wheel, and this water-wheel works a pump that pumps from shallow wells or cisterns into a tank to be used anywhere on the premises. At Ormond we saw more or less orange-trees containing fruit right out in the open air; and, by the way, the past winter has been the mildest one known since the big freeze of six years ago. Many of the Florida people are beginning to have faith that they are going to have a series of winters no worse than they had for several years before the big frost.

On my former trip I spoke of the beautiful town of Daytona. Instead of stopping at Ormond to see the doctor, we went on to Daytona where we spent the night. This is one of the handsomest places in Florida. Residences, stores, streets, and every thing, are models. Although it has more than 3000 inhabitants, there is not a saloon in the place, never has been, and many of the people declare positively *there never shall be*. There is no drunkenness there; and as you go about the town at any time of day you see no roughs or toughs. You hear no cursing, and it seemed to me there was but comparatively little tobacco used. Driving out the saloons, you see, also drives away the tobacco habit, or at least a large part of it. Am I not right?

Daytona has her streets, walks, and every thing else beautifully adapted to the use of wheels; and somebody told me that, with a population of only 3000, they at one time counted up 1500 wheels owned in the place. As a consequence, you see not only boys and girls going everywhere on wheels, but old men and old women seem to ride with much ease and enjoyment.

Let me go a little further, and tell you there are four automobiles in the place, used almost constantly for carrying passengers. In order to save time I wanted to get over to Port Orange very early in the morning, only five miles away; and as the liverymen wanted \$1.50 to carry me there, I asked what it would cost me by automobile. The reply was that it would be 30 cts. if I waited till they had five passengers; but I wanted them to start by 7 o'clock so as to catch Mr. Case before he went off to any of his out-apiaries. Now, \$1.50 is a pretty big price to pay for being carried only five miles; but I had never ridden in an automobile, and it occurred to me it would be a rather fine thing to swing around to my friends' home early in the morning in an automobile. The landlord did not think they would get out their machine by 7 o'clock, even if they did promise to; but it was up before the hotel right on the minute, and then friend Brown and myself took our seats. I do not know but the driver guessed I was a Yankee before we made the five miles, which took us just 22 minutes. When about half way to Port Orange we met a man driving a white horse. He reined up by the fence in order to let us pass. Now, Mr. Brown says he told me that the man looked like Mr. J. B. Case, but I did not hear his remark. In fact, I was so intent on watching that automobile, and in asking questions, that I did not notice the coun-

try round about, nor any thing else. In due time we were at Port Orange. We went up to a store and inquired for the residence of Mr. Case. Pretty soon we were the center of an admiring group of juveniles, and some older people as well, who followed us to the Case residence. After Mrs. Case had extended to me a kindly welcome she looked troubled, and explained that her husband and daughter had just gone to Daytona. Friend Brown here interrupted by saying:

"Why, Mr. Root, that was Mr. Case we passed. Don't you remember a man with a white horse, with a nice-looking girl by his side in the buggy? As we passed them I told you I thought that was Mr. Case, but I guess you didn't hear me."

"Why, friend Brown, I saw a white horse and somebody driving, but my mind must have been *entirely* occupied by that automobile, for sure, for I did not see the driver nor (strangest of all) any *girl* at all."

Well, the automobile was awaiting my commands. I had hired it for an hour. I asked the man if he could catch the rig with the white horse before they got to Daytona. He replied that he could catch any horse that "ever made tracks" before it could go half that distance. So friend Brown and I got back into the carriage, and we started on a race with a man who had two miles the start of us. The driver undertook to turn too short, or else he imprudently ran into a bank of sand. The automobile balked. Friend Brown and I got out, but still it balked. By lifting on the wheels we finally got it out of the sand; but about that time something else happened; but before telling about it I wish to digress a little.

Some time last summer when the grandchildren and I were out in front of our home I thought I would show them some "tricks" I learned when a boy, of a sleight-of-hand performer. I tossed into the air a rather heavy enameled basin. This I caught on the point of a stick, and soon had it spinning like a top. Then I said to the boys, "Now, boys, I am going to show you a trick that is very difficult. In fact, I have seen but one other man in all my life who could do it."

I then threw up the basin, intending to catch it on the point of my stick as before. But something went wrong, and it struck me on the nose. It came pretty near knocking me down. I dropped the basin and stick, and started for the house. One of the boys went off giggling. The other one afterward informed his mother that he "shouldn't wonder if God let the basin strike grandpa on the nose as a punishment for bragging." Now, I did not *think* I was bragging when I told the boys I had never seen any person except one besides myself succeed in spinning a plate in the way I could do it, or at least used to do it when I was a boy, but I guess my young grandsons' reproof was a rather just one after all. Even *grandfathers* should be careful about bragging.

Well, when I rode into the town of Port Orange on an automobile I do not know but I felt a little proud—not, surely, of myself—

but of this great invention just coming out at the dawn of the present century; and had Howard been present when we were getting that automobile out of the sand I do not know but he would have said again, "May be God thought best to punish grandfather for wanting to 'show off.'"

Well, I was not trying to show off at the time I got my punishment, but perhaps I was a little in that line, just before. Two years ago, as some of you may remember, I got a "crick" in my back while lifting an iron pipe, and then stayed out in the mud and rain until I caught cold. Well, when I lifted on the wheels of that automobile, all at once I got another crick right in the well-remembered spot. But we got the machine started; and I thought that, if I kept real still, may be it would not last very long. We put after the white horse; but we had lost some time, as I have explained, and then we lost some more time in making inquiries. Although we made the five miles in 18 minutes we did not see Mr. Case and his white horse. We went all over the town and looked everywhere, and finally gave it up. So my \$1.50 was gone and here I was still in Daytona. I had been longing for a bicycle-ride over those beautiful streets, and so I got a wheel and was soon (in spite of the "crick") back again in Port Orange. The wheel cost 50 cents, and it cost 55 cents more to express it back; so you see my short cuts to get ahead of the railway were pretty expensive (\$2.55) after all.

Well, after I had had a good nap, the white horse, with my friend Case and his nice-looking daughter by his side, got around. Miss Case helps her father with the bees; and they two together rear not only more queens than anybody else in Florida, but I think their queens give about as good satisfaction as any reared in Florida or any other State. It was a bright warm day, and I enjoyed looking over the bees and watching them bring in their immense loads of variously colored pollen.

Before I dismiss the automobile, permit me to say the owners of the four machines are making arrangements to make regular trips to Daytona and surrounding towns. They issue coupons. Below is a copy of one of them.

THE DAYTONA TRACTION CO.

CASH FARE COUPON.

Good for One Mile or any portion thereof.

Not Good if detached.

No. 291.

These coupons are good for one mile, and cost 5 cents each. If one of the machines passes you anywhere in the country, and you have a coupon in your pocket, you can ride a mile or as many miles as you choose, at the uniform rate of 5 cents a mile.*

*Oh, yes! about my punishment. When I was riding a wheel or walking along the street the trouble in my back did not amount to much; but when I sat down, for even only a moment, I found it next to impossible to get up without limping and making a wry face; and I was obliged to explain to the friends for some days afterward the cause of my malady, and apologize to them for getting up and starting out with such great deliberation. Some of you may ask why I

In a garden in Port Orange we saw beautiful strawberries full of buds, blossoms, and ripe fruit. In the same place I saw some exceedingly ornamental foliage-plants. I believe they call it Chinese mustard. It is grown as a sort of salad.

My next stopping-place was New Smyrna. I started down the street to find a wheel to hunt up my bee-keeping friends, when somebody who was riding past on a wheel sang out, "Hello there!"

I stopped and replied, "Well, what is it?" "Oh! nothing," said the stranger; "but I wanted to speak to you a minute."

Then I thought his voice sounded familiar. It was our irrepressible friend J. Y. Detwiler. If you do not know friend Detwiler, just get into his neighborhood and you *will* know him pretty soon. He peremptorily bade me come right along with him. He rides a wheel when on the land, and when on the water he rows a boat, taking his wheel along with him in the boat. His own little girl and two others were with us in the boat. Just before we embarked the obliging keeper of the refreshment stand near the landing gave the children a pineapple that was getting to be a little overripe. They thought it was not a very good one; but when a slice was passed to me just then and there, I should have pronounced the pineapple the greatest gift God ever gave to man in the way of fruit. I was just getting over my sickness enough to appreciate it, and had begun to regain my appetite. I suppose you know I am a great talker. Well, Mr. Detwiler is *something* of a talker himself (I can imagine a broad smile on the faces of his friends and acquaintances when they read this).

Mr. D. is not so much of a bee-keeper just now, because he has another hobby. Most bee-keepers are given to hobbies more or less. Well, his present hobby is *fish*; and his special theme is to give the great wide world *more* fish and *better* fish than it has ever had before in any stage of human history. The State of Florida has already appointed him State Food Commissioner; and the United States itself has entrusted to his care millions of little fishes already (this is a true story, and I mean just what I say) to be entrusted to waters both salt and fresh that are outside and inside of Florida everywhere. While we were crossing the water he began explaining to me the valuable qualities of different varieties of clams; but I cut him short by telling him I tried to eat clams once when I was down east—(clear down to "Bosting," in fact); but, although I admired and enjoyed almost every thing around the Hub of the universe, I did not enjoy or admire *clams*. Friend D. did not say

did not have some pain-killer liniment ("arnica" or "witch-hazel") with me. Well, I have tried all of these things so highly recommended by almost everybody; but, to tell the honest truth, I can not see that they have any effect whatever one way or the other. The rubbing, of course, does good; and if the medicine is strong enough to raise a blister or even a slight counter-irritation, of course that helps for the time being. But my opinion is that hot water, as hot as you can bear it (or a little more so, perhaps), is just as good as any liniment ever invented. If I make a mistake, and these bottles of stuff in the drugstores possess *real* virtues, may God and my fellow-men help me to see my mistake.

any thing, but started off on another branch of the fish business. At supper the first course was some sort of soup. It looked a little like oyster broth. I was feeling a little faint, and longing for something nourishing and easy of digestion. Malted milk, it seemed to me then, would be just the thing; but this broth or soup at friend Detwiler's was more delicious, nutritious, and nourishing than any thing else in that line I ever tasted in all my life. Yes, I think that is so, come to think of it very deliberately. You see I am finding *every day* something better than I ever found before. That is one of the grand things about this world God has given us to live in. I looked across the table at my wideawake friend, and saw he was watching me.

"Well, Bro. A. I., what do you think of that sort of soup, any way?"

I told him just what I have told you.

"Oh! you do think it is *nice*, do you? And yet you are the chap who would not listen when I talked about clams for food."

"Why, friend Detwiler, you do not mean to say this is clam broth?"

"Yes, Mr. Root, that is exactly what I do say. This broth was made from a little bit of clam with shells about as large as a pea or bean. People around here call them periwinkles; but that is not the correct name. This is a salt-water clam, and there are beds of them where you can scoop them up with a scoop-shovel—bushels of them if you want them. Mash them up and they make the best chicken feed in the world—eggs and shell both at one feed. Wash off the salt water, mash them up, stew out the meat portion, strain the broth from the shells, and you have the delicious soup you are eating now, which certainly is the finest soup in the world, and the most nourishing and wholesome for people of weak digestion. If it could be put up and put on the market as a food for invalids I verily believe it would take the place of every thing else in the whole wide world."

A part of friend Detwiler's scheme is to introduce this periwinkle clam in thousands of places where it will thrive and flourish. And, by the way, before I forget it, let me tell you what friend Brown said about Mr. Detwiler. He said he was working with all his characteristic energy and zeal for the fish business throughout Florida, but that so far the State had never paid him a copper in the way of salary, and he had not *much* encouragement to think it ever will. The railroads are recognizing his value at large, and have given him free passes; and they also help unload his fishes, and place them where he wants them. As yet, friend Detwiler has the happy consciousness of having a job where he "works for nothing and boards himself."

After supper he said, "Mr. Root, would you like to see such a net as Peter had in his hand when the Savior bade him cast his net on the other side?"

"Why, yes, I *should* like to see such a net."

"Well, here is a cast net. Very likely it is pretty much the same thing as was used by the fishermen on the sea of Galilee, when the Savior was present. It is called a 'cast net'

because it is thrown with the hand by a peculiar motion."

Then he picked up the apparatus and started out in the dooryard to show me how it was used. Finally he said, "Why, look here, we might as well go out on the landing." So we walked along out in the darkness. The net was circular, like a big umbrella. Around the outer edge were fastened leaden weights with a cord attached to the center. As friend D. took one edge of the net in his teeth and asked us to stand back a little so he could get a swing I said, "Why, you can not get any fish right up close to the shore, can you?"

"Well, probably not, but I *might* strike one."

Suiting the action to the word he gave the machine a sling and a whirl. It spread out like a parachute in the air, and then dropped with a chug into the water, the leaden weights sinking it to the bottom. As he began to pull in slowly on the rope, a bystander suggested it had got caught on a root or something else. Friend D. said they did not have roots around in there. Then he began to haul up what was evidently a stump or an object of some kind about as large as the rim of your hat. When he landed it on the boards beside us, then, oh my! what a flopping there was! He said it was not the very best kind of fish, but he thought it would do very well for breakfast. It was what they call in Florida a "sheep-head." It looks like what we here in the North call a sunfish, only it has brilliant bars across its sides, painting it something like a zebra. Then my friend had to show me the scientific way of preparing a fish for the frying-pan. He scaled it in a very few moments, then made a few cuts at just the right spot with his knife, and removed one whole side of the fish, clear of the bones and every thing else—just clean meat.

"There," said he, "you see how quickly it is done. Now, that side of the meat is all ready for the frying-pan; or you can hang it up under proper conditions and it will dry out in the air without spoiling, and furnish excellent wholesome food for a long tramp across the desert or anywhere else."

The next morning we had some of that sheephead for breakfast; and, even if they have better fish in Florida salt waters, I think I should be well enough satisfied with the sheephead. But I would have a better name for it.

The next day we had a buggy-ride, and some of that same fish made us a most luscious dinner—at least it was luscious to me. We called during the day on many of the old friends whom I met six years ago. Harry Mitchell and his good wife are keeping a very pretty little country store, but they are still bee-keepers, and making good results too. I forgot to say that Mr. Case, Florida's great queen-breeder, has right along during these poor years secured something like 100 lbs. per colony, besides rearing hundreds if not thousands of dollars' worth of queen-bees annually.

It began to rain in the afternoon, and we had quite a trip to make, so our calls were very brief. We looked into friend Hart's or-

ange-shed at Hawks Park, and had a little chat with him at his home. He too has been doing fairly well with bees, even though many claim that frost has about killed the industry. Along toward night we called just long enough to shake hands with E. A. Marsh, his wife, and daughter. The Marsh people have one of the neatest and prettiest honey-houses I ever saw anywhere; and I think it must be all the time in apple-pie order, for I found it that way six years ago, and it was just the same then as on my last trip. Mr. Marsh has quite a pretty little grove of Japanese persimmons, and he had managed to save one of the beautiful fruits, and it was in nice order at the time of my trip. The Japanese persimmon is peculiar inasmuch as it has no seed. Just think of a plum the size of an apple, that is clean plum all the way through—no seed or core, nor any thing of the sort.

A little later we called briefly on T. M. Adams, who produced a crop of honey from 200 colonies that astonished everybody some years ago. These good friends are located near Oak Park, and we found lodging over night with another nice family of bee-keepers, Mr. H. S. Barker. One of our old-time boys, who used to work in the factory with us here in Medina, Mr. P. A. M. Feathers, is located just across the way from Mr. Barker. He has a very pretty little apiary for queen-rearing, and also a nice little garden.

The next morning I was obliged to bid my good friend Detwiler good by; and I confess I felt lonesome for quite a little spell, without him. By the way, I want to say that Mr. Detwiler has a very pleasant place where he entertains, not "summer boarders," but winter boarders; and instead of charging them "five dollars a day and upward," as some of the great stylish hotels put it, his terms are only \$5.00 a week. When I remonstrated at his exceedingly low prices considering the excellent table his good wife manages to get up at every meal, he replied something like this:

"Mr. Root, we tell all our boarders that, if they stay with us, they will have to wait on themselves to a great extent. We do not keep a lot of dorkies to chase around and wait on folks. We have plenty of every thing, and try to have it handy; and it is understood all around that, at our moderate prices, our boarders are to wait on themselves, at least to a great extent. Of course, we tell them where every thing is, and how to get at things."

Mr. and Mrs. Detwiler have a very pretty home; have water all around them, and plenty of fish; stores, postoffice, depot, just a little way across the water, and boats always ready; but you may have to take off your coat and "paddle your own canoe" where you pay only \$5.00 a week.

CONVENTION NOTICE.

The spring meeting of the Eastern division of the Northern Illinois Bee-keepers' Association will be held at the residence of B. Kennedy, 7 miles southeast of Rockford, Ill., on rural route No. 5, and 3 miles northeast of New Milford, Ill., on Tuesday, May 21, 1901. All interested in bees are cordially invited to attend.

B. KENNEDY, Sec'y.



PLANTING AND HARVESTING SOJA BEANS.

I have many letters asking me to give my method of planting, cultivating, harvesting and thrashing the soja bean. First, I prepare the land for soja beans as I do for corn. For seed, plant any time from the last of April to July 1, in rows $3\frac{1}{2}$ or 4 ft. wide. I put two or three beans in a hill, 12 or 15 in. apart, and work as I do a corn crop. I let all the leaves shed so the beans will get their full growth, and then dry. I take my bramble-hook or mower and cut in the morning while the dew is on them, because they will "pop out" during the middle of the day. I rake them up with a hay-rake, haul them up in the afternoon to the barn or pound lot, make a rail pen, and thrash as fast as they are hauled. If I had plenty of barn room I would haul in and thrash after I got through cutting.

I plant soja beans, when wanted for hay, in 2-ft. rows, four or five beans in hill, 12 to 15 in. apart, and work twice with cultivator. I cut them any time after blooming. For cow feed I cut with mower two rows at a time, and let it cure as I would any other hay. I plant a large patch of soja beans by the side of my pasture, and find it a big help in August and September, when hot and dry. I cut them every morning and evening and throw them over to the cows, hogs, and stock of all kinds. They eat it as eagerly as green clover. They will do as well on it as on clover.

I sow soja beans broadcast in my corn at the last working, and gather my corn as soon as I can. Then I turn in my cows, hogs, and horses. I let the cows and horses stay in the beans only a short time the first one or two days, for fear they will eat too much. After that there is no danger of their overeating. I use no manure or fertilizer of any kind for soja beans. I often plant them on my thinnest land to improve it. I turn the beans under or cut them early and plant a second crop. It is a splendid crop to follow Irish potatoes. I like soja beans better than any kind of pea, because they do not rot easily when they get wet and are left out for a short time.

Norfolk Co., Va.

W. M. WILSON.

The above I clip from the *American Agriculturist*. My special reason for giving it here is because of what is said about cutting it night and morning for stock when pastures are poor. Soja beans will grow on almost any sort of soil, as above mentioned, and severe drouths seem to affect it but little. Of course, the later kinds do not ripen seed here in the North; but the early soja beans, the one we call coffee berry, will ripen seed perfectly any season as far north as Ohio.

ALFALFA.

Our Ohio Experiment Station has just sent out a press bulletin on alfalfa. We should be glad to give place to the whole of it had we space; but we must find room for the very sensible boiled-down hints as follows which they add at the close of their directions:

NOW FOR A FEW "DON'TS":

- Don't sow alfalfa on poor soil.
- Don't sow alfalfa on wet soil.
- Don't forget to clip it three times the first year.
- Don't turn any stock on it until the next May.
- Don't let alfalfa hay get dry before raking.
- Don't fail to cut your hay in time. That means to be ready to cut by June first.
- Don't ever let stock on your alfalfa meadows in cold weather.
- Don't sow alfalfa seed on unprepared soil, as you do clover.
- If it fails with you, manure the ground, and try again.

Now is the time to sow alfalfa, or any time during May. Sow 15 to 20 lbs. per acre on good soil. When you once get a good stand it is good for many years.

HIGH-PRESSURE POULTRY.

I did not mean to say any thing more on poultry-keeping just now, but I really can not help it. We exchange with something like a dozen poultry-journals, and I tell the clerk to put every thing on my desk in the way of poultry. Well, they are all good—at least I suppose they are; but few of them contain any thing that particularly interests me. It seems to me they are too much the same old story over and over, while there are a thousand things I want to know about poultry that are rarely touched on. For instance, now many days may a hen lay an egg a day without skipping? I thought I had owned hens that would lay a hundred eggs and not miss a day. The trap nest tells me I am mistaken. Some writers say very few hens lay a dozen eggs without skipping a day. Now, this is an exceedingly important matter. If there are broods or individuals that will lay 100 eggs without a miss, *we want them*. Again, I am just beginning to discover by the trap nest that the quantity of food has much to do with it. My six pullets had been giving six eggs a day for four or five days. But one day they got out of their staple ration; and the little shortage in rations knocked off nearly half the eggs for two or three days in spite of the best food I knew how to give them, *after* the shortage.

I think I might fill a page with just such vital questions and suggestions; but this is not a poultry-journal. I wish to say a word, however, about that pugnacious rooster. He chases Mrs. Root out of the poultry-house, and he actually sent me off limping and with a wry face, this morning. I was fixing a nest for a hen that wanted to sit. I thought he could not do much harm anyway; but he flew at my knee, and struck it with both feet and with both wings so that I was glad to beat a retreat. Now, I never before heard through any of the poultry-journals of a rooster that would attack its keeper. After my knee got over hurting I tumbled him over and over in the grass, and gave him a pretty good cuffing, and after some time I succeeded in getting him to run. Then I chased him out and in among the bee-hives until I thought he was conquered; but in a little while he was crowing lustily, and wanted me to stop my work and engage in another "round." If there had been a crowd of the right sort (?) of people I do not know but there might have been bets as to which would whip—A. I. R. or the big lusty Plymouth Rock rooster that would "never say die."

Now, then, does this trait of that particular fowl necessarily indicate unusual vitality, vigor, as well as courage? Will his chicks likely inherit this vigor? I think he would give a chicken hawk a pretty good tussle. He is not afraid of *any thing* nor of *anybody*. Every thing has to get off the walk and go around him—that is, when he is among his group of six pullets. If they are not around, he does not care particularly about fighting. He regards the poultry-house as his special domain; and he evidently thinks the eggs were not laid to be gathered. They are to hatch chick-

ens. Now, is he a sport among poultry, or "are there others"? He will take a little run, and spring high enough to knock a dish out of one's hands, and give your hands and elbows such a thumping you will be glad to back off. I have heard of people who would go for you in a fight, with "both feet." Well, he uses not only both feet but both *wings*.

Later.—I have finally got *three* sitting hens, and they are behaving nicely in the trap nests. When I set one of them I carried out a basin of eggs. I had just got them put under the hen all right, and straightened up, when "that rooster" made a spring, knocked the basin out of my hands, and not only the basin, but my nose-glasses too, went tumbling in the dust. Then he tipped his head to one side and gave me a look that evidently meant, "These sitting hens belong to me, and I propose to run this thing myself." Ernest is planning to get a snap shot of him some day when he is on the "war-path," and we will have him in GLEANINGS. Now if it is a *common thing* to find male fowls with such courage and strength as this one I will drop the subject. Can our poultry-men tell us about it?

By the way, the honey-bee has from time immemorial been considered the emblem of industry; but for patience and *perseverance* I would put a sitting hen at the head of all animated creation. I am just now studying sitting hens.

Special Notices by A. I. Root.

GILT-EDGED GRAND RAPIDS LETTUCE SEED.

We have still quite a number of packets left of this gilt-edged stock seed. If you want to grow some plants to *produce seed*, you had better get some of this, and you had better start in before it gets any later. It will pay you to have the best to start with; and then if you grow more than you want for your own use, there is a good market for a choice article of Grand Rapids lettuce seed every day in the year. Remember, a little packet of this gilt-edge stock seed, grown by the originator himself, costs you only 5 cts.

HUBBARD SQUASH SEED.

It will soon be time to plant it. We have a very nice stock of beautiful plump seed grown by a bee-keeper, and nice Hubbard squashes almost always sell. Large plump seeds are much more likely to make strong healthy plants. See what Gregory says about it in his squash-book. And, by the way, if you have never read "Gregory on the Squash," you had better have the book. The price is only 30 cts. The directions he gives for growing a big crop of squashes will apply very well to growing big crops of almost every thing. The price of the squash seed is 5 cts. per ounce; 1 lb., 50 cts. If wanted by mail, add 8 cts. per lb. extra.

POTATOES FOR PREMIUMS.

For every dollar you send for GLEANINGS, asking for no other premium, you may have a peck of our nice Red River stock of Early Ohio potatoes (35 cts.); and for every dollar you send, that pays for sending GLEANINGS to somebody who has never taken it before, thus introducing it in a new locality, we will send you half a bushel, worth 60 cts. For any of the other potatoes (see table, last issue) we will send you 25 cents' worth for renewal, or 50 cents' worth to any old subscriber who sends us a new name.

SEED POTATOES, SECONDS.

At present writing, April 15, we are practically sold out of all seconds except Carman No. 3 and Russets. These, you will see by the table, are \$1.25 per barrel. We have, however, 85 bushels of Early Ohio seconds, but we can not make these less than \$1.75 per barrel; bushel, 75 cts.; ½ bushel, 40; peck, 25.

BLUE VITRIOL (SULPHATE OF COPPER) FOR SPRAYING.

Some years ago I bought a barrel of the above chemical at 4 cts. per lb., and offered it in our seed catalog at a price away down below what we usually have to pay for it at the drug stores. But it did not seem to sell very well; and even after the price went away up at wholesale *above* our retail price, our friends did not seem even then to appreciate what I was trying to do for them. So I took it out of the price list. Just now, however quite a few begin to see what a chance they had, and remonstrate because I dropped it, and I have been induced to purchase another barrel, but I can can not sell it at old prices. In barrel lots I can barely make it at an even 6 cts.; in 50-lb. lots, $6\frac{1}{2}$ cts.; less than 50 lbs., 7 cts.

THE NEW RUSSET SCAB PROOF POTATO.

I fear our friends are not giving the New Russet potato its just dues. We have never had what might be called a scabby potato on our ground, of this variety. There has never been one on Wilbur Fenn's place, in Summit Co., and he grows them by the hundreds of bushels. I was present last season in the Traverse region when they were digging the Russets, and I never saw a scabby one where there were thousands of bushels, although other varieties scabbed badly. Now, this is certainly a most valuable acquisition in this one respect: and just now in the month of April they are the *best table potatoes* we have got among our whole lot, not even excepting the Freeman. They are not sprouted a particle, and are sound and firm, and yet we are offering them for 35 cts. a peck; 60 cts. per half bushel; \$1.00 per bushel, or \$2.50 per barrel—the same price as the Early Ohio. Had not you better plant a few? We can ship them from here or (by the barrel) from Traverse City, Michigan.

FINE-POINTED LACE SCISSORS FOR CLIPPING QUEENS' WINGS.

In the recent discussion in regard to clipping queens' wings I was a good deal surprised to see some of the—I was going to say veterans, but I think I shall say "big lights"—talking about clipping a queen's wing with a jack-knife. Why not get a spade or a crowbar, and be done with it? I have just discovered that, when we dropped the counter-store business, our fine-pointed steel scissors were dropped with it; yes, and the boys have dropped cant files for filing circular saws (and the saws too, for that matter). But I am talking about scissors just now. No wonder that some of the women inquired if fine pointed scissors would not be a *better* implement than a jack-knife. Years ago I used to buy these scissors directly from the manufacturers, grosses at a time, and we have them in stock yet, and are having orders for them, even though our mailing clerk says they have not been advertised for four years. Price 25 cts.; by mail, postpaid, 27. If you find them handy for any other purpose than clipping wings there is no patent right *against* using them that way. Ernest urges that a bee-keeper always has a jack-knife in his pocket, but not a pair of scissors; but I think he needs the scissors almost as much as he does a knife.

MONEY IN POPCORN.

We clip the following from *American Agriculturist*:

Last year I planted 14 acre of popcorn, and husked from it 36 bushels, a yield of 14 bushels per acre. The corn sold at \$1 per bushel. The land on which it was grown is worth \$60 per acre, less than half the value of the corn. The land had been in blackberries several years up to last year. The corn required no more labor than common field corn. The fodder was worth \$2.—W. L. Anderson, Indiana.

The above reminds me that, when I was a boy, I grew popcorn for my poultry. The grains were small enough for little chickens when they could not eat big corn. I remember I had a tremendous yield—more than farmers grew of the big corn. Well, we have secured some extra nice rice popcorn of Clark, the great seed-corn grower, and we can furnish it at the very low price of 10 cts. a quart; 60 cts. a peck, or \$2.00 a bushel. The above is beautiful, clean shelled corn. It is worth the money to pop; and, by the way, it furnishes an excellent food for human beings. If wanted by mail, add 12 cts. per quart for postage.

SUBSTITUTE FOR BEEFSTEAK AND LEAN MEAT IN GENERAL.

For sometime I have been carefully testing the new products of the Sanitas Nut Food Co., Battle Creek, Mich.; and I am now pretty well satisfied that their protose, or vegetable meat, is as little liable to fermentation in the digestive apparatus as beefsteak and other lean meats. For many years I have had to

be very careful about eating fruits or sweets in general for my last meal of the day. Whenever I did so from choice or force of circumstances I have invariably had more or less distress during the night. When my last meal is pure lean meat and bread and butter, I keep in fairly good health. This matter has been so thoroughly discussed in GLEANINGS, and by tests of thousands of persons with poor digestion, that the matter may be considered pretty well settled. Well, so far as my own experience goes I believe protose will take the place of lean meat in a way that no other vegetable food does. This protose looks like meat and tastes like meat; and the food company claim it has the same constituents as lean meat. It looks and tastes a good deal like what we call beef loaf or a loaf made from chopped or ground meat. Well, now, this food company has lately brought out something that I think would be a formidable rival to honey and maple sugar. They call it meltose, or malted honey (it tastes a *little* like "malted" milk). At present I think I rather prefer it to either maple syrup or honey; and, strange to tell (at least it was strange to me), this sweet does not produce fermentation like other sweets, especially when eaten at the last meal of the day. I have eaten it repeatedly, and in larger quantities than I should were it not for experiment, and it digests perfectly.

The only objection to these two foods I have mentioned, at the present time, is their cost; but I do not believe the protose is going to cost any more than beefsteak for the same amount of nutriment. The meltose at present is rather higher than honey or maple syrup. I understand they are building a large establishment purposely to manufacture these health foods, and they hope to give us lower prices after a while. And, by the way, suppose they do cost a little more. With the protose there is a great saving in work for the good wife. I prefer it just as it comes out of the can, without any cooking at all; and with the meltose is it not *worth* something to be able to keep well without the expense of drugs or doctors?

At present, meltose costs \$1.50 for a 1 gallon can; 80 cts. for half a gallon. A sample of either protose or meltose will be sent to any one on receipt of two 2-cent stamps.

A FEW LEFT---ORDER QUICK!

We have only a few of those slightly damaged bee-books left, so if you want one of them you will have to order very soon. It will be remembered that on January 1st there was a severe fire in our building, burning out entirely four floors above us. The water that was thrown on the fire came down through our floor damaging our stock of books, printing-office, etc. Some of the books were wet slightly, but enough so that they could hardly be sent out as perfect. These are the ones that we wish to offer. The reading pages of all are perfect, only the covers being a little soiled. Here they are, with prices postpaid:

Prof. Cook's "Bee-keeper's Guide," only 60c.
Doolittle's Scientific Queen-rearing, only 50c.
Newman's "Bees and Honey," only 40c.

They are all cloth bound, and latest editions. If you want a year's subscription to the old *Weekly American Bee Journal*, with any of the above books, add 75c to your order. This is a SPECIAL OFFER, and will last only so long as the slightly damaged books last. Better order AT ONCE if you want a bargain.

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